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Report of the Workshop on Research in the Era of Distributed Processing

Berkeley, California
April 30—May 3, 1984

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Report of the Workshop on Research in the Era of Distributed Processing

April 30 - May 3, 1984
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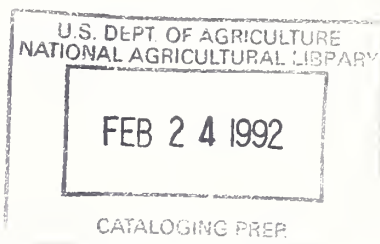


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1. Introduction

The Forest Service is a decentralized organization. Much of our organizational strength and resiliency derives from a management structure that actively distributes decision making and action responsibility to the most locally feasible level of the Forest Service. The Forest Service is a distributed management organization. A new phase of computer technology, termed "distributed processing", has been developed that appears to be ideally suited for enabling the Forest Service to maintain and even strengthen its basic management philosophy while coping as an organization with the challenges we will face over the next decade. Distributed processing basically means placing computers at widely dispersed locations, but designing those computers to integrate into a compatible system so that the many parts can act as a whole when they need to. Distributed processing recognizes that most of the computing need is at the local level, but there are times when some or many of those local computers need to function as an integrated system. Decentralized management recognizes that most decisions need to be made at the local level, but there are times when some or many of these local decision makers need to function as an integrated decision system.

New computer technology offers another beneficial advancement. Historically, computers were mainly designed for, and benefitted, manipulation of numerical data. About a decade ago, computers began to be available that specialized in the manipulation of written language. These computers tended to be small self-contained "word processing" systems. Since their introduction, these machines have increased the scope of administrative tasks they can perform and have come to be termed Office Automation Systems (OAS). At the same time, smaller computers were being developed that could perform many numerical manipulation or Data Processing (DP) tasks. In fact, the same basic computer hardware was becoming capable of performing OAS and DP tasks with only the software, or machine instructions, differentiating between OAS and DP usage. We are now at the point where the same machine has both OAS and DP software available as an integrated package, allowing for the purchase of one system to perform both OAS and many DP tasks. By placing these new machines at many locations and linking them with proper telecommunications one can create an integrated distributed processing network that is capable of processing words and numbers as part of a total information system.

These technological advances have spawned a new concept, or perhaps the awakening of an old one, that words and numbers should not be thought of as distinct entities but rather should be thought of as one thing - information. We as an organization spend alot of time and money on information. Forest Service Research at its most embryonic level exists to create and disseminate information. Government is now defining its philosophy and concepts of information management. The Forest Service is one of the leading agencies involved with those definitions.

Today, the Forest Service is in the early stages of implementing an integrated OAS/DP distributed processing system called FLIPS (Forest Level

Information Processing System) under the governing concept of information management. FLIPS will be an entry vehicle into the era of distributed processing. Although it may be difficult to accept now, FLIPS will in the future be viewed as a forerunner, a precedent setter, and a learning experience. Given this viewpoint and the historically justified fear of good technology badly applied, the Forest Service embarked on a major information management study called the National Systems Management Review. The findings of that review have been accepted by the Forest Service as cornerstones for information management. Quoting from the Preface of the National Systems Management Review Report -

"As we enter this exciting and challenging era, we must prepare ourselves not only to take full advantage of the opportunities but also avoid the pitfalls. Most importantly, we must ensure that we are the masters and not the slaves of this new technology."

The Chief has stated eleven principles to guide the implementation of National Systems Management Review recommendations. Quoting the first and the last -

"1. The Forest Service mission remains the same and it will not change just because we implement new technologies. The objective is to provide new technologies to our employees to accomplish their jobs more efficiently.

11. Productivity gains and savings from FLIPS must be captured and shifted back to on-the-ground resource management and research. The objective is to return the benefits to those functions that have financially supported the acquisition of FLIPS."

Forest Service Research is a vital information source for Forest Service employees and forestry managers worldwide. As the Forest Service moves into the era of distributed processing, Forest Service Research must play a leading role in formulating the principles, guidelines, precedents and innovative management practices that are needed to more productively generate research information, to ensure that the information generated is responsive to the future needs of the forestry community, and to ensure that the knowledge created is available to the forestry community in the form of usable information. We held a Workshop on Research in the Era of Distributed Processing in Berkeley, California from April 30 through May 3, 1984 as a step in that formulation process. This Report presents the results of that Workshop.

The Workshop brought together representatives from all of the Research Stations and the WO. A total of 47 participants attended. The Workshop addressed both the research and research administration aspects of distributed processing. Participants examined the topic from an information management and not a technological viewpoint. Participants were selected on the basis of their knowledge of, and roles in, the Forest Service Research organization. Individual participants represented the

people who must apply distributed processing in their everyday jobs in order for the Chief's principles and the National Systems Management Review recommendations to bear fruit. Technical assistance was available to the Workshop when it was needed to answer questions and WO representatives were available to discuss policy questions and bring the Workshop up to date on activities of the Chief's Office in regard to information management.

This Report mainly consists of the efforts of the participants as reported through their Work Groups. Section 2 explains how the Workshop was structured. Sections 3, 4, 5, and 6 contain the four Work Group Reports that are the substance of the Workshop. Section 7 compiles the Work Group recommendations in one list. The Work Groups began their deliberations with the understanding that the National Systems Management Review was the cornerstone of the Forest Service approach to information management. They also had the most up-to-date knowledge available about other information and distributed processing efforts going on in the Forest Service.

The Work Group Reports discuss 30 Issues and present 70 Recommendations. One of the most gratifying aspects of the Workshop was the enthusiasm and hard work displayed by the participants. Participants not only represented all Stations but also consisted of a broad spectrum of Research personnel including Project Leaders, scientists, Station Directors, Deputy and Assistant Directors, administrative personnel, support personnel, planning and application specialists, library specialists and some very helpful contributors from Forest Service units not in Research.

Participant enthusiasm and their recognition of the importance of Research involvement in the continuing process of information management in the era of distributed processing in the Forest Service prompted one general recommendation from the Workshop. As the Workshop progressed, many participants pursued avenues that supported, paralleled, or in some case tended to duplicate issues being addressed by the National Systems Management Review Implementation Plan, the Information Requirements Project, Directives Review Project and other initiatives. The participants realized that many of the efforts were important to Research and that they, the participants, could contribute significant input to them.

Recommendation:

Station and Research Staff Directors provide a voluntary list of interested individuals, who may be available to assist with national information management efforts, to the Deputy Chief for Research. The list will indicate areas of expertise and interest. The Deputy Chief for Research will apprise the Deputy Chief for Administration about this resource (cf. Recommendation A2-5-1). The result of this recommendation would be that Research will have a greater opportunity to assist in the development of policies and standards that will impact the way we will do business over the next decade.

2. Workshop Structure

The Workshop structure was designed to address how Forest Service Research will utilize and manage distributed processing. The Workshop addressed distributed processing from a management perspective not a technology perspective. It was divided into two Issue Areas, one dealing with research and the other dealing with the administrative support of research. Each Issue Area was divided into two groups, one primarily concerned with internal activities and one primarily concerned with external activities.

- A. Administrative Issues Area
 - 1. Support Services and Related Areas Work Group
 - 2. Budget Process and Related Reporting Areas Work Group
- B. Research Issues Area
 - 1. Research Work Unit Work Group
 - 2. Research Output and Technology Transfer Work Group

Work Group A1 examined administrative issues that involve internal Station activities; Work Group A2 examined administrative issues involving Station-WO, Station-Region, and Station-Station activities; Work Group B1 examined issues involving the research process at the Research Work Unit level; Work Group B2 examined research processes involved with information input to and output from the Research Work Unit. An expanded discussion of the Work Groups follows.

Work Group A1: Support Services and Related Areas.

This Work Group was specifically designed for Stations to collectively examine the impact of distributed processing on internal Station administration, share ideas among Stations about ways different Stations manage similar administrative functions, define areas where more uniform formats would help Stations and areas where specialized formats should be maintained, highlight areas (e.g. NFC) where changes in external support could help internal Station administration, and to develop recommendations to be considered for implementation at all Stations and recommendations to be considered as options for individual Stations.

Objectives: Define ways that distributed processing can improve productivity of Station support services and related administrative areas.
Promote inter-Station dialogue and exchange of ideas.
Highlight items where improved external support could result from distributed processing.
Develop specific recommendations for implementation of items developed by the Work Group.

Work Group A2: Budget Process and Related Reporting Areas.

This Work Group was designed to examine the flow of information between the WO and Stations with the intent of reducing the quantity and improving the quality and timeliness of that information through the use of distributed processing. The guiding philosophy was that the WO and

Stations agree on a minimum reporting requirement. Format, time frame, quality, etc. would be defined and Stations would independently determine how they will meet the required information need. Each Work Group member brought a comprehensive list of what their Station currently reports to the WO. An example of a possible goal would be to have the Research Attainment Report format revised so that it can be used to serve all attainment reporting needs including special reporting, such as Acid Rain, on a once a year basis. Or to develop an information data base from which all reports could be composed. Budget related information flow is a prime concern of Stations and the WO. Effectively managed distributed processing appears to offer great potential for improvement in this Work Group area.

Objectives: Define ways to reduce the quantity of information currently reported to WO by Stations.
Define ways to improve the quality and timeliness of information flow between the WO and Stations.
Devise ways to efficiently manage large special reporting requirements.
Develop specific recommendations for implementation of items developed by the Work Group.

Work Group B1: Research Work Unit

This Work Group was designed to include the viewpoints of our basic operating entities, Research Work Units, in discussions of the impacts of distributed processing on Forest Service Research. This Work Group looked at both short-range and long-range impacts; its central purpose was to focus on ways to improve research productivity and ways to improve the internal functioning of RWUs. Some examples of discussion items were internal RWU administrative management, collection of field data, computer aided design, impact of micro/mini technology on modeling, impact of distributed processing on services to RWUs, and impact of shared services on RWUs. This Work Group also examined the long term outlook for Research in view of the greatly increased distributed systems capacity and skills expected for many of our principal users.

Objectives: Define ways that distributed processing can improve the research productivity of RWUs.
Promote discussion of future trends in research in view of distributed processing.
Highlight areas where the specialized needs of RWUs need to be emphasized.

Work Group B2: Research Output and Technology Transfer

This Work Group was designed to examine the inflow of information needs to, and the output of research from Research at all levels in view of distributed processing advancements. The Work Group considered the process of identifying user needs, problem selection and user feedback, possible changes in research output format, library services, impact of significantly increased NFS user systems capabilities, impact on non-NFS users, impact (new) on scientist grade evaluation of distributed

processing, and ways to improve effectiveness of technology transfer.

Objectives: Define ways that distributed processing can improve analysis of user needs and interaction with users.
Define probable impacts of distributed processing on research output (quantity and form).
Define ways that distributed processing can improve technology transfer.
Examine longer-term impacts of distributed processing on research output.

3. Report of Work Group A1: Support Services and Related Areas

Work Group Members: Robert B. Erickson, NE, Chairman
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Deborah C. Allen, RM
John R. Erickson, FPL
Beverly C. Holmes, INT
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Gail Kuklok, NC
Vickie Modrell, PNW
John F. Prokop, NC
Neal B. Smith, PSW
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Summary of Work Group Discussions:

The Work Group met April 30 and began with individual introductions and presentations of what hardware each Station had in operation. The role of the Group, the prework, and what was expected to come out of this Workshop was then discussed. It was agreed that the role of the Group was to identify the most significant issues or areas that should be addressed to improve the effectiveness of Support Services through the use of distributed processing technology. A draft Group Issue Statement, Objective Statement, and Work Process Statement was then prepared and tentatively agreed upon.

The Group brainstormed major areas relative to in-house administrative processes under distributed processing. This resulted in eighteen issues which were then prioritized as having the greatest potential for improving Support Services to the Research program. The Group then divided into three sub-groups, each to address three or four of the top eleven issues. The charge was to determine if each particular issue was valid, was within the groups charter, and whether issues might be combined. Over the next 2 1/2 days the subgroups discussed their issues and met periodically with the larger group to validate and redirect efforts.

Seven final issues were identified as most significant. The issue description, current situation, recommendation, resulting effect, and timing were included in the Subgroup reports. The total A-1 Work Group reviewed and modified the report and then submitted it to Issue Area Chairman Eldon Ross on May 3, 1984.

Introduction:

There are many information/data systems involved in the Station administrative process. Significant reductions in paperwork, improved

productivity, communication, and National consistency can be gained through conversion into distributed processing.

GROUP ISSUES & RECOMMENDATIONS:

Issue/Problem A1-1:

It is important that Research implement distributed processing consistent with the entire Forest Service organization. The effective use of distributed processing in administrative support depends upon having access to equipment necessary for intergroup and intrastation interaction.

Situation:

1. To effectively utilize distributed processing research and support services needs to implement FLIPS on the following schedule:

1984	40% complete
1985	75% complete
1986	100% complete

Given the allocation limitations on purchase of FLIPS hardware and software, Research must evaluate all opportunities to share implementation with neighboring units. This is important to implement the flow of research information to support NFS, WO Staffs, and other users.

2. For the foreseeable future the Forest Service will have both Data General and other electronic hardware. While this is necessary as long as specific equipment is still needed to meet program needs, there is organizational resistance to releasing currently used equipment.

Recommendation A1-1-1:

By July 30, 1984 Deputy Chief for Research request authority to acquire FLIPS equipment needed by Research in accordance with the schedule listed in situation statement A1-1.

Recommendation A1-1-2:

Station Directors replace all non-Data General electronic equipment used for administrative and support activities as the Data General (FLIPS) system can perform the other workload. Non-DG equipment will be released as surplus or contract use terminated.

Issue/Problem A1-2:

The Forest Service Coordinated Directives-Mail-Records System must be followed by all organizational units to provide for the effective use of the FLIPS distributed processing system.

Situation:

1. Current mail and file policy and practices have received a low priority attention among many organizational levels within the Forest Service.

2. The ability and opportunity for individuals, staff groups, and locations to communicate and create records through electronic means can jeopardize organizational integrity (delegations of authority, policy

review and approval, work priority setting, etc.) if the Coordinated Directives System policies are not followed.

Recommendation A1-2-1:

By April 1, 1985, the WO InS Staff clarify and document distributive processing policies in the Forest Service Manual, and Station's implement:

- a. the filing system requirements supporting official documents,
- b. communications lines of authority, and
- c. the need for maintaining hard copy verses electronic files.

Recommendation A1-2-2:

By August 30, 1985, Station Directors establish:

- a. orientation training for mail and file procedures under the CEO System,
- b. control of records management and correspondence system use, through Business Management Reviews,
- c. delegations of authority for issuing electronic communications, and
- d. internal routing and filing procedures.

Issue/Problem A1-3:

All Forest Service organization levels who have need for official information/data should have electronic access under distributed processing.

Situation:

1. Hard copy records are currently available only to sending and receiving staff units.
2. Currently available information, in hard copy or staff micro systems, is not always up-to-date.

Recommendation A1-3-1:

By October 1985, Chief and RF&D's identify distributed processing information needed for managing the FS.

Recommendation A1-3-2:

By December 30, 1985, based on information needs identified, Chief and RF&D's determine level of access needed Forest Service wide.

Issue/Problem A1-4:

Forest Service units, yet to install data general equipment, would benefit from the experience and knowledge of those units who are now operational.

Situation:

1. Each unit acquiring Data General equipment is establishing operating procedures and experiencing similar problems separately.
2. Stations may be losing time, money, and productivity in separately establishing the Data General supporting systems and procedures.

Recommendation A1-4-1:

By September 30, 1984, Directors at each Station establish a systems user group to address system's implementation, operating procedures, and related training and priority user access.

Recommendation A1-4-2:

By October 1, 1984 RF&D's with operational Data General systems, identify experts that can assist and advise other units as they come on line. Provide list of individuals to the Deputy Chief for Administration. Assistance from the list of experts would come via team or individually, as needed when the Data General equipment is installed.

Issue/Problem A1-5:

Distributed processing is creating organizational impacts.

Situation:

The implementation of distributed processing, in addition to having many positive benefits for the Forest Service, requires rethinking our organizational structure to take full advantage of this new technology, and to recognize the changes that are occurring in the way we operate.

Organizational Changes:

1. Increased speed and overall improvement in communications,
2. Reduced paperwork,
3. Changed roles for staff, resulting in:
 - a. fewer positions in some areas, more positions in others,
 - b. need for different skills (programer/analysts, systems managers, and possibly electronic engineers),
 - c. changes in career ladders (secretary/clerical) with some increased opportunities, and
 - d. increased span of control.
4. Current supervisory groupings may no longer be needed.

Organizational Requirements:

1. Regroup skills to manage information as a resource.
2. Share resources between Regions, Stations, and Area.
3. Reduce staff commensurate with economics and efficiencies resulting from distributed processing.

Recommendation A1-5-1:

By October 1, 1985, Station Directors organize to manage information as a resource.

- a. assign mail and directives management into an information systems function.
- b. strengthen telecommunications management and assign as part of an information systems function.

Result:

- consistent with WO and RO organizations.
- places responsibilities with appropriate technical skills.
- accelerates priority of FLIPS implementation.

Recommendation A1-5-2:

By October 1, 1985, Station Directors organizationally group outyear and current year budget preparation responsibility.

Result:

- consistent with other FS organizations.
- takes advantage of new technologies available to enhance budget planning.
- more efficient use of available staff expertise.
- assigns budget management under one supervisor.

Recommendation A1-5-3:

By October 1, 1985, Station Directors study the benefits of establishing combined service units, utilizing distributed processing technologies.

Include the following:

- a. scientific and technical (library) services
- b. editorial services
- c. publication management and distribution services, and
- d. contracting services

Establish units on a National or zone basis, i.e., contracting done for all Stations by one Station or for four Stations by one Station or Region.

Result:

- increased efficiency, reduced staffing and costs.
- some reduction in quality of support due to distance from clientele and loss of personal contact.
- takes advantage of available technologies.
- fulfills requirements of Reform 88, Federal Field Structure Review, etc.

Recommendation A1-5-4:

By October 1, 1985, Station Directors analyze need for current positions in Station and support management functions under a distributed processing environment (i.e., Deputy and Assistant Directors, RSS Groups and Sections).

Result:

- reduced GA and Program Management costs,
- increased workload on remaining management staff positions, and
- fulfills requirements of Federal Field Structure Project.

Recommendation A1-5-5:

Study impact of new technologies on secretarial/clerical personnel, staff jobs, and career ladders.

1. By June 1, 1985, WO PM Staff with Research, develop revised roles and staffing model guidelines for clerical positions assuming full availability of distributed processing technologies. Use task force that includes personnel specialists/classifiers and clerical staff.

2. By September 30, 1985, Stations Directors implement new secretarial/clerical guidelines once they are completed.

Result:

- ideal clerical organization, considering technology, may not be compatible with personal needs of employees.
- could result in better defined career ladders, more options/specializations, and

-increase quality, efficiency of secretarial assistance.

Issue/Problem A1-6:

Station administration and scientific support need a core set of information (data bases and related forms) to meet needs in a distributed processing system. Standardized data bases, processes, controls, and formats are needed.

Situation:

The evolution of research administration and scientific support management systems, following FLIPS implementation, provides an opportunity to evaluate information processes and data base needs. New timesaving procedures are necessary to maximize the use of distributed processing in using and managing information. The processes, data base needs, procedures, controls, and formats are not now fully defined.

Recommendation A1-6-1:

By September 1984, Deputy Chief for Research establish a task group of Station administration and scientific support representatives to evaluate, define, and prioritize a core set of Station level information needs.(Ref.Issue A1-3.)

Recommendation A1-6-2:

By April 1985, Task Group (cf. Recommendation A1-6-1) present recommendations to Deputy Chiefs for Research and Administration.

Recommendation A1-6-3:

By April 15, 1985, WO Staffs evaluate and report the need for official FS forms, as well as the process requiring them, in light of distributed processing. This should be in conjunction with the effort to identify Chief's Office (National) data and information requirements.

Recommendation A1-6-4:

By October 15, 1984, WO InS develop necessary policy, standards, and processes for creating, using, and maintaining electronic forms--including controls and security. This should be in conjunction with Action Item #1 of the Draft SRT Implementation Plan.

Recommendation A1-6-5:

By December 30, 1984, Deputy Chiefs assign the responsibility for studying the conversion of FS forms, from hardcopy to electronic, among the Regions and Stations.

Results:

- The review of information needs and development of a core set of information will reduce duplicated data and eliminate unnecessary information.
- The establishment of standardized processes for collecting information will improve the quality of information, and provide transportability of personnel skills.

- Distributing the systems development effort throughout the organization maximizes resources and reduces duplication of effort.
- Some forms may be eliminated.

Issue/Problem A1-7:

A communication mechanism is needed to identify common software development, software needs, and to share this information between units. (Reference B-2 Work Group Report).

Situation:

FS units currently operating Data General equipment are developing software which can have Service-wide applicability. Further, it will be necessary to develop new and efficient programs to implement standardized data bases and time-saving procedures to accomplish research management goals. We do not have mechanisms in place to share current applications or to jointly define future needs.

Recommendation A1-7-1:

By June 1985, WO CS&T Staff give high priority to reviewing and revising FSM 6620 and related handbooks (standards for software development, validation, and documentation) to reflect the distributed processing environment.

Recommendation A1-7-2:

By October 1984, WO CS&T Staff establish a task group to develop a communication mechanism for sharing software applications and needs such as:

- a. National library for software exchange (See Action Item #10 of the SRT Draft Implementation Plan).
- b. FLIPS Conference System.
- c. Software information workshops.
- d. Newsletter.

Recommendation A1-7-3:

By July 1984, Deputy Chief for Research evaluate the need for and request authority to purchase standardized software packages that are unique to research administration and scientific support processes. For example, software such as MINITAB, SAS, and Scientific Notation.

Results:

- Stations can save time and money by utilizing common software programs that have been developed or purchased by other Stations, or in some cases, by Regions.
- Common software needs can collectively be identified and a means for satisfying those needs can be addressed by those units who are the most interested. Again, time and money savings should be the bottom-line result.
- Ability to perform appropriate administrative and scientific support applications in-house resulting in maximum use of FLIPS; time and money savings should result.

4. Report of Work Group A2: Budget Process and Related Reporting Areas

Work Group Members:

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John DeLatorre, PSW
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Anne S. Fege, NE
John W. Henley, SO
Richard L. Hubbard, PSW
Elmer E. Moyer, PNW
Gloria A. Richardson, WO
Irene Tatum, NC

Introduction:

Distributed information processing affords significant opportunities for improving the communications aspect of budget and related reporting, and for reducing paperwork. Workgroup A-2 was charged to examine the flow of information between the WO and Stations with the intent of reducing the quantity and improving the quality and timeliness of that information through the use of distributed processing where possible. The basic issue addressed by the Work Group was the lack of a fully integrated information system to satisfy the needs of the WO and the Stations that is tied to the new distributed processing technology. Information systems need to be integrated to use emerging technology more efficiently.

Summary of Work Group Discussions:

Work Group discussions centered on the identification and need for data requested by the Office of the Deputy Chief for Research from the Stations, and on ways to reduce and streamline this data flow. Deputy Chief's Office-to-Station and Station-to-Station data flow was recognized as significant but was not dealt with in detail. Data requests by WO units other than Research were also recognized as important but were beyond the scope of this Work Group's charge.

Work Group discussions were greatly influenced by the current WO effort to identify the Chief's office data and information requirements (Robertson's 6600 letter of March 20, 1984). The principles and guidelines being used for this effort were adopted for use by this Workgroup in its deliberations. The principles and guidelines are:

- Required data and information must be essential to meet legal and program requirements.
- Critically question external and internal information requests and challenge nonessential requirements.
- Share and network information to the widest extent practical.

-Make information decisions with a high degree of cost consciousness, reflecting needs, cost/benefit, and efficiency. When in doubt, leave it out.

-Simplify, consolidate, and eliminate reporting requirements to the maximum extent possible.

-Maximize use of the distributed information processing environment and available technology information processing decisions.

In addition, Work Group discussions relied heavily on the following documents:

-National Systems Management Review Team Report

-SRT Draft Implementation Plan

-Buckman's response (6600 letter of 4/26/84) to the Report of SRT Working Group B-3 (System Development and Data Base Management Roles and Responsibilities in Research).

The four major data areas addressed by this Work Group are budget (outyear and current), research attainment reporting, facilities management, and program management. Two other areas addressed include the development of a core (standardized) data base for Stations and training, or "experience sharing," among research units (WO and field) as we move into the era of distributed processing.

Issue/Problem A2-1:

The current Research program budgeting process is cumbersome and does not take advantage of existing distributed processing technology.

Situation:

Station budget proposals are currently submitted in hard copy on ten separate forms. Much of the detailed data relating to RWU's is not currently utilized at the WO level in the early stages of the budget development.

Recommendation A2-1-1:

Delete the following forms from the FY 1987 budget instructions:

Form IA - Priorities for funding decreases.

Form IB - Priorities for funding increases.

Form IE - Increment/Decrement RWU Summary.

Form II - Research Construction.

Form III - Safety and Health Construction Projects.

Form IV - FLIPS Expenditures

Form V - TT Projects

Current forms to be maintained are:

Form IC - Program narrative

Form ID - Increment/Decrement BLI Summary

Appendix N-2 - General Administration

This is assigned to the Deputy Chief for completion by October 1, 1984.

Recommendation A2-1-2:

Information/data required to generate the forms deleted in A2-1-2 above will be maintained and kept current by the Stations in a standard format

to be submitted electronically in later stages of the budget process as needed. This system will be designed by PSW Station in cooperation with the Deputy Chief's office. Before implementation this format will be reviewed by all Stations. Completion date is November 1, 1984.

Expected Results:

1. Reporting burden is substantially reduced.
2. Budget data is more current and readily accesssible.

Issue/Problem A2-2:

Current reporting of Station financial plans does not take advantage of existing data processing technology.

Situation:

The report forms 6500-33 and 6500-35 are difficult to type, mail, read, and copy into other report forms. Some data elements on the form are repeated year after year. The data elements are used for several different reports and have to be reformatted for each use.

Recommendation A2-2-1:

Create a budget execution data base in lieu of preparing Forms 6500-33 and 6500-35 and incorporate in the data base a process to capture special report needs generated by the annual budget cycle. (Example: Special interest items in the "Book of Notes.") The Deputy Chief's office will have the system designed by September 15, 1984, and implemented by December 1, 1984.

Recommendation A2-2-2:

Provide Station (allocation) and appropriation level data to the Station through creation of a data base which will replace State sheets and budget activity sheets. The Deputy Chief's office will implement by December 1, 1984.

Expected Results:

Station and WO will have more timely interactive access to data. Update of data will not cost as much or take as much time. Manipulation of data and report generation will be faster and less costly.

Issue/Problem A2-3:

Information on facilities is used by different staff groups. This information is accumulated at the local level and then summarized again at the WO.

Situation:

The WO asks for information on facilities on an annual basis. Examples of the types of information requested are health and safety projects, construction projects planned, maintenance obligations, energy retrofit, and facilities inventory (staffing).

This information is needed on an annual basis; however, the changes from year to year are not always significant. For example, the Stations may "dust off" the construction projects that were submitted the previous year and update the information. Health and safety projects are often treated in a similar manner. In both of these examples, the main change between years is the cost of the project.

Information on maintenance obligations and needs is requested periodically by the WO and is also required for effective Station management.

Recommendation A2-3-1:

RM Station will take the lead with input from other Stations and the WO to develop and define the construction minimum data needs. Once these needs have been identified, a draft of the data elements and proposed data base design will be provided to the Stations for comment. This will be accomplished by October 1, 1984, with implementation planned for January 1, 1985.

Recommendation A2-3-2:

RM will take the lead with input from other Stations and the WO to develop common data elements which are needed by managers in planning for maintenance of facilities; e.g., condition surveys, project work plans, and the need for maintenance plans. A draft proposal will be available for review by October 1, 1984. This will be in final format by January 1, 1985.

Expected Results:

1. Reporting needs of similar information but different formats will be discontinued.
2. Facility information needs and accounting information will be available on a current basis.

Issue/Problem A2-4:

The Deputy Chief's office and each Station Director's office needs research program information on a recurring basis from Station headquarters and RWU's.

Situation:

Some information needs can be met with functional and administrative records like budget, personnel, etc. Other information needs are not available from functional records and are needed on a sporadic basis. Examples are RWUDs, supervisory reports, advanced training status, foreign travel needs, national meeting attendance needs, GMR and CPR background information and status reports, national review status reports (NFPA-CORE, Growth and Yield, FIA, IPM) and other WO staff requests.

Program management information needs vary among Stations depending on organizational structure, management style, and specialized program needs. These needs include publication status, study status, scientist

panel evaluation schedules, action items from SSR's, RWUD revision status, and work force management plans.

Recommendation A2-4-1:

The Deputy Chief's office utilize, where possible, information available from the core data base (see Issue/Problem A2- 6), budget, personnel, and other functional data bases.

Recommendation A2-4-2:

The Deputy Chief's office provide feedback to Stations on program management information needs. The Stations can better prepare and respond to specialized requests if more is known about the nature of requests received by the WO.

Expected Results:

Stations can meet WO requests and Station program management information needs more accurately, faster, and with less impact on RWU research activities.

Issue/Problem A2-5:

Development of distributed processes for administration and program management requires skills and resources not available at every Station. Special skills are not currently being shared between Stations.

Situation:

Stations have varying levels of skills, resources, and experience in applying distributed processing to research management.

Recommendation A2-5-1:

Stations will prepare an inventory of current programs, skills, and resources in distributed processing, which will be used as a basis for initiating the sharing of skills among Stations. This will be submitted to the Deputy Chief's office by September 15, 1984 (call letter will be issued).

Expected Results:

Stations will be able to draw upon specialized skills and resources at other Stations. Rather than attempting to develop expertise in all areas of administration and program management, each Station will concentrate some of their resources in a few areas.

Issue/Problem A2-6:

There is not a core data base that is common to all Stations.

Situation:

It is necessary to search many files to secure common data.

Recommendation A2-6-1:

The NE Station will take the lead with input from other Stations and the WO to develop the data elements to be included in a Research core data base and propose the data base structure prior to October 15, 1984. The following standards will be used in defining the elements:

1. There must be a specific established need for each element of data.
2. Every Station must maintain up-to-date data.
3. Data must be standard and common to all units.
4. Data must not be administratively confidential.
5. Files must be flexible.
6. Core data files must be accessible to all research units.

Kinds of Data:

Personnel:

1. No. of scientists by highest degree held.
2. No. of research professionals by highest degree held.
3. Advanced training.
4. Name of employee by location; i.e., position structure, position title, grade, and salary.

Program:

1. All data elements.
2. Attainment reports.

Financial Data:

1. Current financial allocations summaries.
2. Station financial plans; current year:
 - a. RWU #, project leader's name
 - b. Location
 - c. Title
 - d. SY's
 - e. Funds by budget activity
 - f. Other appropriated funds
4. Budget year appropriations by RWU.
5. Current year appropriations by RWU #.
6. Historical years appropriation by RWU#.

Physical Plant Data:

1. Location.
2. Ownership: FS, leased, Univ. provide
3. Type: Lab, lab/office, storage: square footage
4. Staffing capacity. Current staffing, FS and cooperators, by affiliation.
5. Year built.
6. On-campus/near campus.
7. Major facilities needs.
8. Minor construction needs.
9. Experimental forests and ranges:
Names, location, acreage, ownership, date established, biological significance.

Expected Results:

Time and money will be saved by maintaining and using common data bases by eliminating duplication and improving quality of data used in decision making.

Issue/Problem A2-7:

Preparation of the annual Research Attainment Report is cumbersome and does not utilize distributed processing capabilities.

Situation:

The 1982 revision of attainment reporting instructions significantly reduced the burden of this reporting process. However, distributed processing provides the technology to further reduce the burden and improve the usability of attainment information. (cf. Recommendation A2-6-1.)

Recommendation A2-7-1:

The Deputy Chief of Research should appoint a Task Force composed of representatives of WO Staffs and Stations, to evaluate the essential needs, efficiency, and usefulness of the information submitted in the current reporting process. Report due January 1, 1985.

Recommendation A2-7-2:

The Task Force will recommend a standard attainment report "data base" of Form I information that allows for electronic transmission and storage of highlights and Form II information. Due January 1, 1985.

Recommendation A2-7-3:

CRIS reporting be a part of the 1985 Research Attainment Report data file.

Recommendation A2-7-4:

Recommend support for ongoing efforts to standardize the FS bibliographic base. The standard base should serve the Attainment and CRIS reporting process.

Expected Results:

The suggested changes would seem particularly advantageous to WO Research Staffs who could then rapidly review and retrieve selected information for special reports, congressional inquiries, budget hearings, and RWU summaries. As it is now, it is often easier for WO staffs to call Stations than to sort through information they already have. Computerized storage of--and access to--Research Attainment Report information would also be of great value within each Station in the preparation of background material for functional supervisory reviews, technical assistance visits, scientist evaluation panels, briefings, and responses to inquiries.

5. Report of Work Group B1: Research Work Unit

Work Group Members:

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Alon Carter, InS
Willie R. Curtis, NE
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Vernon J. LaBau, PNW
Joe K. Mauldin, SO
James T. Paul, SE (also with B2)
William T. Simpson, FPL
J. Alan Wagar, PSW

Summary of Work Group Discussions:

Expected short- and long-range impacts, potential pitfalls, and opportunities for productivity improvements associated with distributed processing (DP) can be separated into two broad categories of RWU operations: scientific research and development, and Research Work Unit management. Initial discussions surfaced a number of questions within each of these categories:

I. Scientific Research and Development

A. Literature Search capabilities

1. At what level of the research organization should electronic literature search capabilities be provided?
2. What degree of flexibility is needed for accessing alternative literature search systems and databases?
3. What impacts will such capability have on the use and management of existing and/or planned library services?
 - a. WESTFORNET
 - b. NATFORNET
 - c. Station library services

B. Experimental Design

1. What are the opportunities for computer-aided-design (CAD) of scientific experiments?
2. What impacts would such capability have on the role of the station statistician?

C. Data Handling (acquisition, analysis, database management)

1. What system performance characteristics are desirable for handling scientific data?
 - a. What CPU capabilities are required?
 - b. How much flexibility is desirable in accessing data processing software (including graphics)?
 - c. What provisions are needed for real-time loading and archiving of data on non-volatile storage media?

- d. How much flexibility should be provided in accessing remote computing facilities?
 2. What provisions are needed for adequate security of unpublished data?
 - D. Modeling
 1. What system performance characteristics are desirable for modeling physical, biological, and management systems or processes?
 - a. CPU characteristics
 - b. Flexibility regarding access to remote computing facilities
 - c. Software availability (e.g., higher-level simulation languages)
 2. Who will be responsible for developing or acquiring modeling software?
 - E. Management of Research Output
 1. What opportunities will distributed processing offer in facilitating or streamlining quality control and publication production systems?
 - a. Peer review
 - b. Policy review
 - c. Editorial services
 - d. Publication procedures
 2. How can distributed processing facilitate the dissemination of research output?
 - F. Product/Systems Development
 1. What impact will distributed processing have on the demand for new products requiring development effort?
 2. Who will be responsible for accomplishing development work?
 3. What organizational or procedural changes are desirable to effectively accomplish necessary development tasks?
 4. When does development end and implementation begin (and who is responsible then)?
 5. What changes are needed to ensure proper credit is given for development accomplishments?
 6. What kinds of standards and conventions are desirable for products requiring multiagency compatibility and how should they be imposed?
 7. When should prepublication databases or data-sets be made generally available and how?
- II. RWU Management
- A. How can RWU's organize to make most effective and efficient use of distributed processing technology?
 1. Role of project clerk
 2. Role of project scientist
 3. Role of field and laboratory technicians
 - B. How can distributed processing system resources be most efficiently allocated?
 1. Among administrative units
 2. Among individual users
 3. Among categories of information processing activities

- (e.g., data processing vs. office management functions)
- C. What are the likely impacts of distributed processing technology on future research needs (including the mix of R, D & A activities)? How can the research organization effectively respond to these anticipated changes?
 - D. How can the negative impacts of proliferating requests for information originating outside the RWU be minimized?
 - E. What provisions are needed for distributed processing system support?
 - 1. Who is responsible?
 - 2. How can production delays be avoided during system down-time?
 - F. What are the prospects for the following DP applications:
 - 1. Real-time access to RWU budget status information including flexible spreadsheet formatting
 - 2. Real-time maintenance of attainment report information, position descriptions (Factor IV), property inventories, personnel files, and other dynamic management databases
 - 3. Automated "promise card" systems including electronic cueing of extramural research delivery deadlines
 - 4. Automated template systems for routine document and report preparation -- e.g., RFP's, cooperative agreements, supervisory review reports, position descriptions, award recommendations, and T&A's (by exception)
 - 5. Interactive expert systems for personnel management functions like performance evaluation, implementing adverse actions, etc.
 - 6. Annotated electronic shopping lists for training courses, research tools, extramural research talent, etc.

The following set of issues and recommendations was derived from discussion of the questions listed above.

Issue/Problem B1-1:

Distributed processing can be used to facilitate literature searches, thus improving the research output potential of scientists.

Analysis:

Scientists must be able to access the literature of numerous and diverse disciplines, and the task of searching all relevant literature is time consuming and tedious when done by manual means. Computerized searches of most literature databases requires specialized expertise, thus most if not all Stations provide this as a service to scientists. Because the need for literature search services is generally infrequent, a one to two week turn-around time is usually adequate, and special expertise is necessary to perform a search, centralizing this as a service to scientists is desirable in most cases.

Recommendation B1-1-1:

Stations and FPL should continue to provide centralized service to scientists for literature searching needs.

Recommendation B1-1-2:

Stations and FPL should review their literature search process to assess whether distributed processing can facilitate current procedures.

Recommendation B1-1-3:

Stations and FPL should develop an awareness of literature search capabilities and communicate new procedures to scientists.

Expected Results:

- Centralized literature search service enhances productivity by removing the need for each scientist to learn literature search procedures.
- Distributed processing can enhance efficiency over current procedures, by electronically transmitting requests and output between scientists and literature search personnel.

Issue/Problem B1-2:

Distributed processing can greatly enhance data collection, handling, and analysis.

Analysis:

There is an ever-increasing capability for electronic data logging. Research scientists must be encouraged to utilize this technology in order to increase productivity and improve scientific output. Therefore electronic data storage and retrieval capabilities must be made available. This may require large proportions of the distributed processing system capability and capacity.

Recommendation B1-2-1:

Adequate hardware and software be provided to RWU for routine data collection, handling, and analytical needs.

Recommendation B1-2-2:

Allocation of distributed processing hardware and software be responsive to local need so that RWU's can most efficiently accomplish their missions.

Recommendation B1-2-3:

Although use of distributed processing for data handling and analyses should be encouraged, RWU should not be restricted to its use. Forest Service policy should permit the use or purchase of hardware and/or software necessary to meet specialized data processing needs.

Recommendation B1-2-4:

RWU's be allowed to continue to use present automated data processing equipment, and justifiable updates should be allowed. Such systems should be phased out only when the distributed processing system has been shown to do the job more efficiently and at lower costs.

Expected Results:

The expected results of the use of distributed processing for data

manipulation at the work unit level will result in enhanced research productivity.

Issue/Problem B1-3:

Adequate security should be provided for all users.

Analysis:

Inadequate security could result in inadvertent or deliberate misuse or misinterpretation of unprocessed data. This could reflect adversely on FS research, or could discourage scientists from using the system.

The FOIA may be related to security. Does it imply freedom of electronic access?

If raw data are locked away by a user, there may be a need for a master access in case of emergency.

Recommendation B1-3-1:

Each user should be provided with the necessary level of security to prevent unauthorized access to files.

Recommendation B1-3-2:

There should be clarification concerning how the FOIA affects electronic security.

Recommendation B1-3-3:

A system for master access be provided to guard against information losses.

Recommendation B1-3-4:

Security documentation is needed for major data bases.

Expected Result:

Adequate security will prevent misuse or misinterpretation of FS research data.

Issue/Problem B1-4:

Who will develop, maintain, and support computer-assisted aids for resource management?

Analysis:

1. New ways for researchers, administrators, and resource managers to interact, coupled with greatly enhanced computing power distributed throughout the Service, will generate new in-Service demands for computer-assisted resource management procedures. Concurrently, the emerging technologies that have prompted Forest Service adoption of distributed processing are changing the way our non-Service research users are operating. Both the kinds of research needed and the forms taken by output are being affected. In addition to computational packages, users

may want menu-driven systems that help them extract research results pertinent to specific situations, much as physicians now have programs that, in prompting answers to a series of questions about symptoms, provide better diagnoses of diseases than the average physician.

2. Questions concerning who will develop, maintain, and support computer-assisted resource management procedures emerge as part of a larger issue that has always been with us: What is the role of Forest Service research in development, application, and implementation?

3. The skills needed for good research are not always those required for efficient development and implementation, and in many cases, the most effective approaches to solving problems are not "research" in the sense of generating new scientific knowledge. A division of labor is needed. Yet, in contrast with many corporations, which spend far more for development than research, the Forest Service has little recognizable funding and staffing devoted to the development needed to shape promising research results into systems ready for application. Even if developed, systems may flounder because the research unit that created them cannot afford to support them.

4. Development of computerized procedures creates its own set of issues:

- a. To what extent or in what situations should researchers develop software?
- b. In what situations should researchers contract with professional programmers for development of software.
- c. When we contract for software development, do we have sufficiently sophisticated negotiators so we get what we seek? Are researchers in a better position to do this than administrators or managers?
- d. Given the ability to communicate a system or model simultaneously to many potential users, how do we avoid adoption of unvalidated models and extrapolation to regions and settings to which they don't apply? (Overlap here with group B2)
- e. How do we avoid a proliferation of duplicate systems and uncontrolled modifications of systems? NFS may be greater problem than research.
- f. Do our reward systems encourage us to address all the problems that must be addressed to get research results converted into useable technologies that can be transferred to users?

Recommendation B1-4-1:

The Chief and Staff should appoint a task group to explore organizational changes that will assign responsibility, staffing, and funding for the development, maintenance, and support of computer-assisted resource management procedures that will exploit the capability of distributed processing.

Alternatives might include (a) attaching a small development and applications unit to each Station, (b) setting up task-specific ad hoc teams, (c) assigning funding, staffing, and responsibility to S&PF, (d) creating a new Deputy Chief area for development programs.

Probable results: Increased availability of powerful, computer-assisted resource management procedures.

Recommendation B1-4-2:

Deputy Chiefs assign a group to recommend procedures to monitor and control what computer-assisted resource management procedures are established, what modifications are made, and to what extent extrapolation is permitted beyond the populations and settings used in their development.

Alternatives might include (a) setting up "gatekeepers;" (b) setting up a feedback loop in which users report their use, the nature of results obtained, and to what extent they consider the results satisfactory; and (c) establishing electronic bulletin board(s) providing for the exchange of information on who is doing what in software development.

Probable results: Less duplication of effort, resource management procedures of better quality and reliability, and disciplined application of these procedures.

Recommendation B1-4-3:

Deputy Chief for Research assign a group to recommend policy defining who will support research-developed software (i.e., who will respond to user questions and training needs, incorporate improvements, modify programs to fit new hardware systems, etc.)

Probable results: Dependable availability and performance of software and availability of advice and training.

Recommendation B1-4-4:

Chief and Staff select a task force, preferably including outside management consultants conversant with high-technology corporations, to examine the impact and adequacy of our reward systems for getting useful research results, carrying them forward into proven technologies, and getting the technologies into practice. (As a start, see "Research rewards in the Forest Service," by Albert J. Simard, North Central Station.)

Probable results: More dependable follow-through on the development required to make promising research results useful and faster implementation of improved procedures.

Issue/Problem B1-5:

The effective collection and utilization of resource data across broad geographic areas and administrative entities is severely limited by the lack of compatability among data sets.

Analysis:

-Preparation of the National Assessment, profiles of atmospheric deposition, national fire reports, etc., can be enhanced and accelerated through effective use of distributed processing.

-Rigid standardization of data collection procedures is neither possible nor desirable.

-Criteria are needed to insure an acceptable level of compatability among data sets that are to be utilized for broad-scale evaluations.

Recommendation B1-5-1:

Small task forces be formed in those research functions that have responsibility for regional or national resource information to establish criteria for compatability among data sets and explore the potential use of distributed processing to facilitate the process.

Results: Improved capability to respond quickly and effectively to requests and needs for broad-scale assessments and evaluations of resource information.

Issue/Problem B1-6:

There is a need to manage anticipated conflicts among demands for distributed processing resources.

Analysis:

- A primary feature of the Data General is office automation.
- The scientists primary need of the system is data handling/analysis.
- There will be administrative demands on the system.
- Space on the system is limited, and as it becomes overloaded, systems performance deteriorates and ultimately, scientific productivity declines.
- Costs of telecommunications use of "outside" computers are increasing.
- Many scientists will request real-time access to data.
- Many scientists will request timely responses to tape mounting for reading data and archiving.

Recommendation B1-6-1:

Station Directors, Assistant Directors, and Project Leaders allocate available distributive processing resources among RWU scientists and staff by criteria that seek to optimize Station management and scientific productivity.

Results:

- Most effective management of distributive processing resources.
- Increased scientific productivity.
- Increased program management and administrative efficiency.

Issue/Problem B1-7:

Distributed processing will present the opportunity to use alternative forms of organization to enhance scientific productivity.

Analysis:

- Some clerical or shared support services may change with distributed processing.
- Use of distributed processing could complicate and change the roles of such support services as offered by biometricians, programmers, editors, and librarians.

-The best organizational structure will vary from location to location.

Recommendation B1-7-1:

Station Directors, Assistant Directors, and Project Leaders should evaluate alternative organization structures in light of RWU needs and their respective distributed processing capabilities.

Results:

- More efficient operations.
- Enhanced scientific productivity.

Issue/Problem B1-8:

The normal functioning of RWU's will become highly dependent upon the distributed processing system (Data General equipment).

Analysis:

- There is a need to keep the system up and operating at all times.
- Some RWU's do not have the expertise necessary to run and maintain Data General equipment.
- PSW Station and NFS have valuable experience with Data General equipment.

Recommendation B1-8-1:

- "On location" operating systems expertise must be provided through either staffing, training, or shared services.
- Provision should be made by the Station Director for consulting a network of experienced users.

Results:

- Provide for smooth implementaton of the system.
- Minimize system down time.
- Enhance scientific productivity.

Issue/Problem B1-9:

Distributed processing, in the hands of the users, may create new demands for scientific knowledge.

Analysis:

- There may be some "short-fused" demands for further research outputs.
- RWUD's and PA's should remain flexible.
- Form of some research products will change.
- Substance of some research will change.

Recommendation B1-9-1:

- Managers and scientists should constantly anticipate changes in research needs.
- Deputy Chief for Research and Station Directors should issue guidance for establishing criteria for determining appropriate responses to requests.

Results:

- Future research will be relevant and timely.

Issue/Problem B1-10:

Distributed processing can make management of RWU's more efficient/effective in several areas of general administration.

Recommendation B1-10-1:

Station Directors need to consider and prioritize these opportunities for use of distributed processing in GA areas:

- Real-time access to budget status for the RWU.
- Real-time attainment reporting.
- Automated "promise cards" including cuing systems.
- Automated "templates" for RFP's, PO's, T&A's, etc.
- Property inventory.
- Personnel files (except sensitive data).
- Annotated electronic shopping lists of courses and tools for training.

Issue/Problem B1-11:

Inappropriate use of distributed processing capabilities may have negative impacts on scientific productivity.

Analysis:

- There may be a tendency for individual scientists to devote time to distributed processing tasks more appropriately done by clerical and technical (programming) staff.
- In-Service and outside requests for information and new research not relevant to the RWU mission may increase.
- There may be a tendency to request an excessive number of reviewers for a given document.
- There may be a tendency to request an excessive number of responses to administrative processes (reply due).
- Project Leaders are concerned that they are not being kept informed about efforts to minimize impacts.

Recommendation B1-11-1:

- Project Leaders develop guidelines for appropriate use of distributed processing.
- Criteria should be established for determining relevant response areas for information and research--provisions are needed to protect scientists from requests that could be handled elsewhere.
- Limits should be set for the number of reviewers for a given document and responsibilities assigned to key reviewers to assure quality responses.
- Administrative response requests should be restricted to selected scientists and staff.

Results:

- Decrease or contain the scientists paperwork load.
 - Enhance scientific productivity.
-

Issue/Problem B1-12:

There is a concern that additional PAMARS type "elephants" will develop at the national level.

Analysis:

- There is a general need expressed for real-time budget and fiscal information at the RWU level.
- Historic patterns reflect 3-month delays in fiscal information from NFC and timely information on national procurement and travel plans.
- There is nothing to indicate that another national budget/fiscal handling system will provide real-time information for RWU's.
- Specialists from a single area of expertise cannot design efficient systems that are sensitive to "end user" needs.

Recommendation B1-12-1:

- Station Director use distributed processing to maintain a real-time "preliminary" budget and fiscal information base at the RWU level subject to final reconciliation with NFC.
- Task forces that are given the job to design management support systems should include staff, scientists, and decisionmakers from all RWU/Station levels and that commercially available forms of software (e.g., spread sheets) be used before new programs are written.

Results:

- Improved management at the Station and RWU level.
- Enhanced scientific productivity.

6. Report of Work Group B2: Research Output and Technology Transfer

Work Group Members:

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Summary of Work Group Discussions:

This workgroup was primarily concerned with measures to facilitate Research use of distributed information processing for technology transfer. Potentials of distributed information processing for improving communications with clientele groups in research program formulation were discussed as a secondary issue.

The Work Group report deals with three technology transfer topics:

1. How should the Forest Service manage the planning, development and implementation of Research produced software?
 2. What steps can be taken now to facilitate use of electronic communications for technology transfer?
 3. Should a national standardized bibliographic data base receive high priority for development and use in the service-wide distributed information processing system?
- A fourth issue concerns research program development-
4. How should opportunities offered by distributed processing for compilation and evaluation of user identified research needs and response to users be implemented?

Issue/Problem B2-1:

How should the Forest Service manage the planning, development, and implementation of major software from Research?

Analysis of Issue:

Research programs often produce computer software intended for application by research users. The usefulness of this software is influenced by the manner in which it is publicized and distributed, by the quality of the product and its documentation, and by the ease with which it can be transported to machines other than the one on which it was developed. After initial development, the utility of the software is affected by the manner and degree to which it is maintained and periodically updated.

It is often not clear where Research responsibilities end and those of user groups begin. Although scientists have a major responsibility in software development, Research seldom has the manpower or mission for long-term software distribution and maintenance. Further, there have been cases in which the target user groups for software have not been identified, and plans have not been made for its ultimate support and transfer, before substantial research investments have been made in software projects.

This issue and recommendations for dealing with it are discussed below in terms of four subtopics:

- A. National direction for software technology transfer.
- B. Procedures for quality control and portability.
- C. Publishing software.
- D. A national repository for software.

A. National Direction for Software Technology Transfer: There is not clear direction for the development and support of major, Research produced software.

Recommendation B2-1-1:

We recommend that the 4050 section of the Forest Service Manual be revised to consider the entire process of research planning as it applies to the development of applications, including software. Planning for technology transfer needs to be interwoven into existing research planning procedures, particularly in problem selection and the development of problem analyses. During this process, projects for which a separate TT plan will be needed should be identified. Technology transfer plans provide a mechanism for identification of users, evaluation of the need for software development, and assignment of responsibility for distribution and maintenance of software, including the definition and identification of official versions.

B. Procedures for Quality Control and Portability: Here, the need is to establish programming standards to facilitate portability and consistent reviews of the software and related documents. At present, there is little uniformity in the way programs are written and documented. Researchers often are unaware of programming standards and the need for them. One tool available is the computer program, TIDY, that reformats FORTRAN programs to improve their readability and reliability. For software to be consistently and adequately reviewed, there must be a set of standards by which the reviewer can judge the computational accuracy of the software. (REF:Computing in the Language of Science, Kenneth Wilson, Science, Vol 224).

Another vital point is that units engaged in major software development must plan for the large dollar and manpower costs of detailed review of their work.

Recommendation B2-1-2:

The Deputy Chief for Research should now establish a committee to further define desirable software characteristics. The committee should address:

- 1) Internal program structure.
- 2) Internal documentation including comments and variable definition.
- 3) External documentation needed.
- 4) Disclaimers.
- 5) Definition of "official" as it relates to software.

Three distinct types of documentation should be considered for each software package:

a) Software description - Provide formulae, algorithms, and organization of program, data requirements and formats for input and output. There should be sufficient information (eg. example I/O data) to allow reviewers to judge the computational accuracy and efficiency of the software.

b) Validation - Provide information to assess the ability of the package to meet its intended purpose. Eg., does a particular growth and yield simulator accurately reflect the actual growth and yield of forest stands that it is meant to forecast.

c) User manuals - Provide necessary information to access software, describe input requirements, and input options including mechanisms for accessing. Describe the range of uses for this software, including limitations and ways to interpret output.

Composition of the committee should include scientists involved in programming from each Research Station.

Recommendation B2-1-3

Make training available to transmitt standards developed in the above recommendation to Station personnel.

C. Publishing Software: Research developed software intended for use outside the originating Research Work Unit should be viewed and handled essentially the same as traditional publications. Such publication is an essential technology transfer step and a part of the scientific review process.

Recommendation B2-1-4:

Policy should be developed to require publication of major Research developed software where it is appropriate. This does not necessarily mean printing the detailed code. The software and related documentation should follow the same procedure of review required for traditional publications.

D. A National Repository for Software: We support the concept of a national repository for Forest Service developed software. This repository should serve Forest Service employees, as well as requests for software from the private sector. We are not definitive, however, as to where this repository be housed, within the service or elsewhere. We are concerned that any such national repository not eliminate the ability of Research Work Units to respond to requests for software, nor should it preclude use of other clearinghouses as a means of distributing individual software.

Recommendation B2-1-5:

Station scientific and administrative personnel be assigned to the committee developing this proposal.

Recommendation B2-1-6:

Forest Service policy should require entry of all software that is published, or documented, into this National Software Repository. We further recommend that a periodic directory of that software be published and circulated both inside and outside the Forest Service.

Issue/Problem B2-2:

What steps can be taken now to facilitate use of electronic communications for technology transfer?

Analysis of Issue: Currently available techniques for electronic communications include such things as computer conferencing, interactive file systems, electronic bulletin boards, electronic abstracting services and document delivery, programmed instruction, electronic catalogues, specialized audience alerting systems, and many others. Widely available private services such as COMPUSERVE and THE SOURCE already provide access to these kinds of electronic innovations to thousands of households and institutions. We anticipate increasing opportunities for Forest Service technology transfer by similar means.

Electronic publishing appears particularly appropriate for Forest Service Research as FLIPS becomes widely installed. Gradual implementation beginning now would lessen the ultimate start-up costs of putting a large volume of publications on electronic files. Since many Forest Service publications are being typed and edited on word processors (and, in some cases, being sent electronically to type-setting) it would be possible to begin establishing tape storage which could ultimately become the basis for "electronic libraries."

Recommendation B2-2-1:

The Chief should appoint a standing committee to explore the feasibility of electronic journals for forestry research. This committee should include Station scientists and editors and WO - InS staff representatives.

Issue/Problem B2-3:

Should a national standardized bibliographic data base receive high priority for development and use in the Service-wide distributed processing information system?

Analysis of Issue:

The Work Group discussed recommendations 4, 5, 14 - 17 of the SRT Group B-3 and Deputy Chief Buckman's comments (6600 memo, Apr. 26, 1984) on each. We also got input from the PSW library staff.

We separated this issue into two topics:

1. Bibliographics for use by Research Work Units and Stations in generating reports.

2. Data base(s) of forestry-related publications.

The first topic raised the following questions:

- Do we need a standard bibliographic data base for documents produced by Forest Service employees and cooperators? Such a base would save time in the generation of various reports (eg., attainment report, quarterly publication list), and publication alerts. What should be the contents of this data base?
- Should there be one national data base, or local data bases maintained at each Station or individual Research Work Unit?

The second topic raised the following questions:

- How much duplication of bibliographic data bases is appropriate in the context of distributed processing? E.g., WESTFORNET, SOUTHFORNET, AGRICOLA.
- Should documents other than research publications be included in the data base?
- Should there be a provision for comment on the usefulness of documents in the data base?
- Should NFS and S&PF be requested to provide similar data bases containing reports that may be useful to Research?
- Who should provide input to these data bases? Will they require special training?

Recommendation B2-3-1:

A bibliographic data base containing all information required for library cataloguing should be maintained in each Station. Data bases should all conform to a standard format. Each record should contain sufficient information (eg., RWU No.) for report generation. Each Station should have personnel trained to enter data in the standard format. These data bases should be accessible to all FLIPS users.

Recommendation B2-3-2:

Software should be developed to generate output of the bibliographic data base in any desired format, eg., ANSI, CBE, other journal formats, internal report formats. We suggest that a Station be designated to acquire and test such software for Service-wide application.

Recommendation B2-3-3:

Research Station scientists and administrators, in addition to library specialists, should be represented on the InS committee, which is studying a FORNET data base to be made accessible through FLIPS as a national system. The committee should consider alternatives in providing bibliographic services, such as that now used by NE at NAL.

Issue/Problem B2-4:

How should the opportunities offered by distributed processing for compilation and evaluation of user-identified research needs and for responses to users be implemented?

Analysis of issue:

This issue contains two related questions:

1. How effective is the existing research needs identification process, and
2. How can distributed processing improve the identification of research needs?

The Work Group recognized that the present research needs identification process is not as effective as it should be and is not fully responsive to NFMA regulations. While this deficiency is not due to the lack of a distributed processing system and is much broader than the issue of distributed processing, FLIPS should improve communication between NFS, S&PF, and Research. In addition, FLIPS may expand our ability to analyze research needs with FORPLAN. The SRT Workgroup B-3 recommended designation of a Region and Station(s) to develop a prototype system for improved research needs identification. Region 8 and the SO and SE Stations are particularly interested in this assignment.

Recommendation B2-4-1:

The Workgroup supports the development of a Region/Station(s) prototype system and feels that further recommendations on this issue are not required at this time.

7. List of Workshop Recommendations

Recommendation:

Station and Research Staff Directors provide a voluntary list of interested individuals, who may be available to assist with national information management efforts, to the Deputy Chief for Research. The list will indicate areas of expertise and interest. The Deputy Chief for Research will apprise the Deputy Chief for Administration about this resource.

Recommendation A1-1-1:

By July 30, 1984 Deputy Chief for Research request authority to acquire FLIPS equipment needed by Research in accordance with the schedule listed in situation statement A1-1.

Recommendation A1-1-2:

Station Directors replace all non-Data General electronic equipment used for administrative and support activities as the Data General (FLIPS) system can perform the other workload. Non-DG equipment will be released as surplus or contract use terminated.

Recommendation A1-2-1:

By April 1, 1985, the WO InS Staff clarify and document distributive processing policies in the Forest Service Manual, and Station's implement:

- a. the filing system requirements supporting official documents,
- b. communications lines of authority, and
- c. the need for maintaining hard copy verses electronic files.

Recommendation A1-2-2:

By August 30, 1985, Station Directors establish:

- a. orientation training for mail and file procedures under the CEO System,
 - b. control, through Business Management Reviews, records management, and correspondence system use,
 - c. delegations of authority for issuing electronic communications,
- and
- d. internal routing and filing procedures.

Recommendation A1-3-1:

By October 1985, Chief and RF&D's identify distributed processing information needed for managing the FS.

Recommendation A1-3-2:

By December 30, 1985, based on information needs identified, Chief and RF&D's determine level of access needed Forest Service wide.

Recommendation A1-4-1:

By September 30, 1984, Directors at each Station establish a systems user group to address system's implementation, operating procedures, and related training and priority user access.

Recommendation A1-4-2:

By October 1, 1984, RF&D's with operational Data General systems identify experts that can assist and advise other units as they come on line. Provide list of individuals to the Deputy Chief for Administration. Assistance from the list of experts would come via team or individually as needed when the Data General equipment is installed.

Recommendation A1-5-1:

By October 1, 1985, Station Directors organize to manage information as a resource.

- a. assign mail and directives management into an information systems function.

- b. Strengthen telecommunications management, and assign as part of an information systems function.

Recommendation A1-5-2:

By October 1, 1985, Station Directors organizationally group outyear and current year budget preparation responsibility.

Recommendation A1-5-3:

By October 1, 1985, Station Directors study the benefits of establishing combined service units, utilizing distributed processing technologies.

Include the following:

- a. scientific and technical (library) services
- b. editorial services
- c. publication management and distribution services, and
- d. contracting services

Establish units on a National or zone basis, i.e., contracting done for all Stations by one Station or for four Stations by one Station or Region.

Recommendation A1-5-4:

By October 1, 1985, Station Directors analyze need for current positions in Station and support management functions under a distributed processing environment (i.e., Deputy and Assistant Directors, RSS Groups and Sections).

Recommendation A1-5-5:

Study impact of new technologies on secretarial/clerical staff jobs and career ladders.

- a. By June 1, 1985, WO PM Staff with Research, develop revised roles and staffing model guidelines for clerical positions assuming full availability of distributed processing technologies. Use task force that includes personnel specialists/classifiers and clerical staff.

- b. By September 30, 1985, Stations Directors implement new secretarial/clerical guidelines once they are completed.

Recommendation A1-6-1:

By September 1984, Deputy Chief for Research establish a task group of Station administration and scientific support representatives to evaluate, define, and prioritize a core set of Station level information needs. (Ref. Issue A1-3.)

Recommendation A1-6-2:

By April 1985, Task Group (cf. Recommendation A1-6-1) present recommendations to Deputy Chiefs for Research and Administration.

Recommendation A1-6-3:

By April 15, 1985, WO Staffs evaluate and report the need for official FS forms, as well as, the process requiring them, in light of distributed processing. This should be in conjunction with the effort to identify Chief's Office (National) data and information requirements.

Recommendation A1-6-4:

By October 15, 1984, WO InS develop necessary policy, standards, and processes for creating, using, and maintaining electronic forms--including controls and security. This should be in conjunction with Action Item #1 of the Draft SRT Implementation Plan.

Recommendation A1-6-5:

By December 30, 1984 Deputy Chiefs assign the responsibility for studying the conversion of FS forms, from hardcopy to electronic, among the Regions and Stations.

Recommendation A1-7-1:

By June 1985, WO CS&T Staff give high priority to reviewing and revising FSM 6620 and related handbooks (standards for software development, validation, and documentation) to reflect the distributed processing environment.

Recommendation A1-7-2:

By October 1984, WO CS&T Staff establish a task group to develop a communication mechanism for sharing software applications and needs such as:

- a. National library for software exchange (See Action Item #10 of the SRT Draft Implementation Plan).
- b. FLIPS Conference System.
- c. Software information workshops.
- d. Newsletter.

Recommendation A1-7-3:

By July 1984, Deputy Chief for Research evaluate the need for and request authority to purchase standardized software packages that are unique to research administration and scientific support processes. For example, software such as MINITAB, SAS, and Scientific Notation.

Recommendation A2-1-1:

Delete the following forms from the FY 1987 budget instructions:

- | | |
|----------|--------------------------------------------|
| Form IA | - Priorities for funding decreases. |
| Form IB | - Priorities for funding increases. |
| Form IE | - Increment/Decrement RWU Summary. |
| Form II | - Research construction. |
| Form III | - Safety and Health Construction Projects. |
| Form IV | - FLIPS Expenditures. |
| Form V | - TT Projects. |

Current forms to be maintained are:

Form IC - Program narrative
Form ID - Increment/Decrement BLI Summary
Appendix N-2 - General Administration

This is assigned to the Deputy Chief for completion by October 1, 1984.

Recommendation A2-1-2:

Information/data required to generate the forms deleted in A2-1-2 above will be maintained and kept current by the Stations in a standard format to be submitted electronically in later stages of the budget process as needed. This system will be designed by PSW Station in cooperation with the Deputy Chief's office. Before implementation this format will be reviewed by all Stations. Completion date is November 1, 1984.

Recommendation A2-2-1:

Create a budget execution data base in lieu of preparing Forms 6500-33 and 6500-35 and incorporate in the data base a process to capture special report needs generated by the annual budget cycle. (Example: Special interest items in the "Book of Notes.") The Deputy Chief's office will have the system designed by September 15, 1984, and implemented by December 1, 1984.

Recommendation A2-2-2:

Provide Station (allocation) and appropriation level data to the Station through creation of a data base which will replace State sheets and budget activity sheets. The Deputy Chief's office will implement by December 1, 1984.

Recommendation A2-3-1:

RM Station will take the lead with input from other Stations and the WO to develop and define the minimum construction data needs. Once these needs have been identified, a draft of the data elements and proposed data base design will be provided to the Stations for comment. This will be accomplished by October 1, 1984, with implementation planned for January 1, 1985.

Recommendation A2-3-2:

RM will take the lead with input from other Stations and the WO to develop common data elements which are needed by managers in planning for maintenance of facilities; e.g., condition surveys, project work plans, and the need for maintenance plans. A draft proposal will be available for review by October 1, 1984. This will be in final format by January 1, 1985.

Recommendation A2-4-1:

The Deputy Chief's office utilize, where possible, information available from the core data base (see Issue/Problem A2- 6), budget, personnel, and other functional data bases.

Recommendation A2-4-2:

The Deputy Chief's office provide feedback to Stations on program management information needs. The Stations can better prepare and respond to specialized requests if more is known about the nature of requests

received by the WO.

Recommendation A2-5-1:

Stations will prepare an inventory of current programs, skills, and resources in distributed processing which will be used as a basis for initiating the sharing of skills among Stations. This will be submitted to the Deputy Chief's office by September 15, 1984 (call letter will be issued).

Recommendation A2-6-1:

The NE Station will take the lead with input from other Stations and the WO to develop the data elements to be included in a Research core data base and propose the data base structure prior to October 15, 1984. The following standards will be used in defining the elements:

1. There must be a specific established need for each element of data.
2. Every Station must maintain up-to-date data.
3. Data must be standard and common to all units.
4. Data must not be administratively confidential.
5. Files must be flexible.
6. Core data files must be accessible to all research units.

Kinds of Data:

Personnel:

1. No of scientists by highest degree held.
2. No. of research professionals by highest degree held.
3. Advanced training.
4. Name of employee by location; i.e., position structure, position title, grade, and salary.

Program:

1. All data elements.
2. Attainment reports.

Financial Data:

1. Current financial allocations summaries.
2. Station financial plans; current year:
 - a. RWU #, project leader's name
 - b. Location
 - c. Title
 - d. SY's
 - e. Funds by budget activity
 - f. Other appropriated funds
4. Budget year appropriations by RWU.
5. Current year appropriations by RWU #.
6. Historical years appropriations by RWU #.

Physical Plant Data:

1. Location.
2. Ownership: FS, leased, Univ. provide
3. Type: Lab, lab/office, storage: square footage
4. Staffing capacity. Current staffing, FS and cooperators, by affiliation.
5. Year built.
6. On-campus/near campus.
7. Major facilities needs.

8. Minor construction needs.
9. Experimental forests and ranges:
Names, location, acreage, ownership, date established,
biological significance.

Recommendation A2-7-1:

The Deputy Chief for Research should appoint a Task Force composed of representatives of WO Staffs and Stations, to evaluate the essential needs, efficiency, and usefulness of the information submitted in the current reporting process. Report due January 1, 1985.

Recommendation A2-7-2:

The Task Force will recommend a standard attainment report "data base" of Form I information that allows for electronic transmission and storage of highlights and Form II information. Due January 1, 1985.

Recommendation A2-7-3:

CRIS reporting be a part of the 1985 Research Attainment Report data file.

Recommendation A2-7-4:

Recommend support for ongoing efforts to standardize the FS bibliographic base. The standard base should serve the Attainment and CRIS reporting process.

Recommendation B1-1-1:

Stations and FPL should continue to provide centralized service to scientists for literature searching needs.

Recommendation B1-1-2:

Stations and FPL should review their literature search process to assess whether distributed processing can facilitate current procedures.

Recommendation B1-1-3:

Stations and FPL should develop an awareness of literature search capabilities and communicate new procedures to scientists.

Recommendation B1-2-1:

Adequate hardware and software be provided to RWU for routine data collection, handling, and analytical needs.

Recommendation B1-2-2:

Allocation of distributed processing hardware and software be responsive to local need so that RWU's can most efficiently accomplish their missions.

Recommendation B1-2-3:

Although use of distributed processing for data handling and analyses should be encouraged, RWU should not be restricted to its use. Forest Service policy should permit the use or purchase of hardware and/or software necessary to meet specialized data processing needs.

Recommendation B1-2-4:

RWU's be allowed to continue to use present automated data processing equipment and justifiable updates should be allowed. Such systems should be phased out only when the distributed processing system has been shown to do the job more efficiently and at lower costs.

Recommendation B1-3-1:

Each user should be provided with the necessary level of security to prevent unauthorized access to files.

Recommendation B1-3-2:

There should be clarification concerning how the FOIA affects electronic security.

Recommendation B1-3-3:

A system for master access be provided to guard against information losses.

Recommendation B1-3-4:

Security documentation is needed for major data bases.

Recommendation B1-4-1:

The Chief and Staff should appoint a task group to explore organizational changes that will assign responsibility, staffing, and funding for the development, maintenance, and support of computer-assisted resource management procedures that will exploit the capability of distributed processing.

Recommendation B1-4-2:

Deputy Chiefs assign a group to recommend procedures to monitor and control what computer-assisted resource management procedures are established, what modifications are made, and to what extent extrapolation is permitted beyond the populations and settings used in their development.

Recommendation B1-4-3:

Deputy Chief for Research assign a group to recommend policy defining who will support research-developed software (i.e., who will respond to user questions and training needs, incorporate improvements, modify programs to fit new hardware systems, etc.)

Recommendation B1-4-4:

Chief and Staff select a task force, preferably including outside management consultants conversant with high-technology corporations, to examine the impact and adequacy of our reward systems for getting useful research results, carrying them forward into proven technologies, and getting the technologies into practice. (As a start, see "Research rewards in the Forest Service, by Albert J. Simard, North Central Station.)

Recommendation B1-5-1:

Small task forces be formed in those research functions that have responsibility for regional or national resource information to establish

criteria for compatibility among data sets and explore the potential use of distributed processing to facilitate the process.

Recommendation B1-6-1:

Station Directors, Assistant Directors, and Project Leaders allocate available distributive processing resources among RWU scientists and staff by criteria that seek to optimize Station management and scientific productivity.

Recommendation B1-7-1:

Station Directors, Assistant Directors, and Project Leaders should evaluate alternative organization structures in light of RWU needs and their respective distributed processing capabilities.

Recommendation B1-8-1:

- "On location" operating systems expertise must be provided through either staffing, training, or shared services.
- Provision should be made by the Station Director for consulting a network of experienced users.

Recommendation B1-9-1:

- Managers and scientists should constantly anticipate changes in research needs.
- Deputy Chief for Research and Station Directors should issue guidance for establishing criteria for determining appropriate responses to requests.

Recommendation B1-10-1:

Station Directors need to consider and prioritize these opportunities for use of distributed processing in GA areas:

- Real-time access to budget status for the RWU.
- Real-time attainment reporting.
- Automated "promise cards" including cueing systems.
- Automated "templates" for RFP's, PO's, T&A's, etc.
- Property inventory.
- Personnel files (except sensitive data).
- Annotated electronic shopping lists of courses and tools for training.

Recommendation B1-11-1:

- Project Leaders develop guidelines for appropriate use of distributed processing.
- Criteria should be established for determining relevant response areas for information and research--provisions are needed to protect scientists from requests that could be handled elsewhere.
- Limits should be set for the number of reviewers for a given document and responsibilities assigned to key reviewers to assure quality responses.
- Administrative response requests should be restricted to selected scientists and staff.

Recommendation B1-12-1:

- Station Directors use distributed processing to maintain a real-time "preliminary" budget and fiscal information base at the RWU level subject

to final reconciliation with NFC.

-Task forces that are given the job to design management support systems should include staff, scientists, and decision makers from all RWU/Station levels and that commercially available forms of software (e.g., spread sheets) be used before new programs are written.

Recommendation B2-1-1:

We recommend that the 4050 section of the Forest Service Manual be revised, to consider the entire process of research planning as it applies to the development of applications, including software. Planning for technology transfer needs to be interwoven into existing research planning procedures, particularly in problem selection and the development of problem analyses. During this process, projects for which a separate TT plan will be needed should be identified. Technology transfer plans provide a mechanism for identification of users, evaluation of the need for software development, and assignment of responsibility for distribution and maintenance of software, including the definition and identification of official versions.

Recommendation B2-1-2:

The Deputy Chief for Research should now establish a committee to further define desirable software characteristics. The committee should address:

- 1) Internal program structure.
- 2) Internal documentation including comments and variable definition.
- 3) External documentation needed.
- 4) Disclaimers.
- 5) Definition of "official" as it relates to software.

Three distinct types of documentation should be considered for each software package:

a) Software description - Provide formulae, algorithms, and organization of program, data requirements and formats for input and output. There should be sufficient information (eg. example I/O data) to allow reviewers to judge the computational accuracy and efficiency of the software.

b) Validation - Provide information to assess the ability of the package to meet its intended purpose. E.g., does a particular growth and yield simulator accurately reflect the actual growth and yield of forest stands that it is meant to forecast.

c) User manuals - Provide necessary information to access software, describe input requirements, input options including mechanisms for accessing. Describe the range of uses for this software, including limitations and ways to interpret output.

Composition of the committee should include scientists involved in programming from each Research Station.

Recommendation B2-1-3:

Make training available to transmitt standards developed in the above recommendation to Station personnel.

Recommendation B2-1-4:

Policy should be developed to require publication of major Research

developed software where it is appropriate. This does not necessarily mean printing the detailed code. The software and related documentation should follow the same procedure of review required for traditional publications.

Recommendation B2-1-5:

Station scientific and administrative personnel be assigned to the committee developing this proposal.

Recommendation B2-1-6:

Forest Service policy should require entry of all software that is published, or documented, into this National Software Repository. We further recommend that a periodic directory of that software be published and circulated both inside and outside the Forest Service.

Recommendation B2-2-1:

The Chief should appoint a standing committee to explore the feasibility of electronic journals for forestry research. This committee should include Station scientists and editors and WO - InS staff representatives.

Recommendation B2-3-1:

A bibliographic data base containing all information required for library cataloguing should be maintained in each Station. Data bases should all conform to a standard format. Each record should contain sufficient information (e.g., RWU No.) for report generation. Each Station should have personnel trained to enter data in the standard format. These data bases should be accessible to all FLIPS users.

Recommendation B2-3-2:

Software should be developed to generate output of the bibliographic data base in any desired format, e.g., ANSI, CBE, other journal formats, internal report formats. We suggest that a Station be designated to acquire and test such software for Service-wide application.

Recommendation B2-4-1:

The Work Group supports the development of a Region/Station(s) prototype system and feels that further recommendations on this issue are not required at this time.

APPENDIX A: Station Review Comments on Workshop Recommendations

Recommendation (Introduction):

Station and Research Staff Directors provide a voluntary list of interested individuals, who may be available to assist with national information management efforts, to the Deputy Chief for Research. The list will indicate areas of expertise and interest. The Deputy Chief for Research will apprise the Deputy Chief for Administration about this resource.

PNW - Accept.

PSW - Accept with comment. Recommendations 1, 9 and 31 all deal with sharing of FLIPS expertise and should probably be discussed together and possibly combined. We have some concern that a volunteer approach may not generated the best possible skills bank. How does this list differ (or should it?) from those suggested in A1-4-1 and A2-5-2. We suggest that the people that end up on this list may be available for limited advice but will probably not be available for extended periods.

INT - Accept--Some overlap occurs with numbers A1-4-2, A2-5-1, and B1-8-1.

RM - Accept.

NC - Accept with comment--Coordinate with No. A2-5-1.

FPL - Accept.

SO - Accept with comment - This needs early action as indicated in Recommendation 31. The Southern Station list will probably include individuals with expertise and interest in areas of personnel management, financial management, research program management, secretarial tasks, library functions including bibliographic data bases, data base management, and computer system management.

NE -

SE - Accept.

InS - Accept with comment -- This is included in the National Systems Management Review (NSMR) Action #1.

Recommendation A1-1-1:

By July 30, 1984, Deputy Chief for Research request authority to acquire FLIPS equipment needed by Research in accordance with the schedule listed in situation statement A1-1.

PNW - Accept with reservations. FY 84 FLIPS purchasing is imminent and dollars and purchasing ceilings do not exist to even approach the proposed FY84 40 percent complete acquisition. In concept, however, we agree that the sooner the better.

PSW - Accept with comment. This may be out of our hands. A planned implementation/purchase plan with priorities by Station is needed.

INT - Accept with comment--Each recommendation should be worded to stand alone. Suggested wording: The Deputy Chief for Research will request

authority to acquire FLIPS equipment (hardware and software) so that Research implementation of FLIPS is 40 percent complete in 1984, 75 percent complete in 1985, and 100 percent complete in 1986.

RM - Accept with comment. All targets should be advanced one fiscal year and adjust FLIPS implementation schedules to include research.

NC - Accept.

FPL - Accept with comment. FPL plans to be fully functional in FLIPS by 1986, but plans do not anticipate completion by (ed. before?) 1988.

SO - Accept with reservations - There needs to be some flexibility to allow for Station budget considerations. Station FLIPS procurement plans should provide the information needed for requesting authority. Stations FLIPS procurement and implementation plans may need modification to meet policy for implementation schedule.

NE - Accept.

SE - Accept.

Recommendation A1-1-2:

Station Directors replace all non-Data General electronic equipment used for administrative and support activities as the Data General (FLIPS) system can perform the other workload. Non-DG equipment will be released as surplus or contract use terminated.

PNW - Accept.

PSW - Accept with comment. It is unclear whether "as the DG system can perform.." means when it can perform or because it can perform. Also, does support include scientific support?

INT - Duplicative--This is an ongoing process that needs no recommendation.

RM - Accept with reservation. It should be clear that the non-DG equipment being released is that previously used in administration and support.

NC - Accept with reservations--We generally agree with the release of non DG equipment, but believe such equipment should be released to RWU's before being put on surplus. Each Station has prepared a plan for utilization of excess equipment that has been sent to WO CS&T. This plan should be adequate to meet the intent of this recommendation. This recommendation also needs to be coordinated with No. 43.

FPL - Reject in part. FPL plans to reutilize non-DG equipment in appropriate situations.

SO - Accept with reservations - We would prefer that this recommendation be treated as general policy direction subject to periodic review.

Requirements for Research to implement distributed processing consistent with the Chief's policies should provide the desired result. Concerns with budget, ability of the Data General system to perform the work, and demonstrated utility of other current equipment are key to our reservations.

NE - Accept with no action.

SE - Accept with reservation. - Drop last sentence.

Recommendation A1-2-1:

By April 1, 1985, the WO InS Staff clarify and document distributive processing policies in the Forest Service Manual and Station's implement:

- a. the filing system requirements supporting official documents,
- b. communications lines of authority, and
- c. the need for maintaining hard copy verses electronic files.

PNW - Accept with reservation that it will be recognized it will be sometime beyond April 1985 before most Research locations will have enough FLIPS equipment to use such FSM designations.

PSW - Accept with comment. In item (b) we may need 2 levels: (1) Formal and official communication thru proper channels, and (2) informal scientist to scientist or scientist to user communication. The latter is equivalent to informal phone calls and needs to be encouraged, not inhibited.

INT - Accept.

RM - Accept.

NC - Accept.

FPL - Accept with no action. Implementation of the filing system may not be possible by April 1985. Our initial system may lack appropriate disk space to accomplish this prior to upgrading the system.

SO - Accept.

NE - Accept.

SE - Accept.

InS - A1-2-1, item a: Duplicative -- InS is drafting new policy to clarify electronic filing system conventions and requirements in the Forest Service Manual (FSM).

item b: Duplicative -- InS is drafting new policy on electronic filing to clarify the way information will flow from user to staff to public filing. This implies defining the communications lines of authority.

item c: Reject in part -- Currently, Federal Government agencies must distinguish between record and non-record materials. However, the National Archives and Records Service (NARS) is directing a task group to study the problem of maintaining a paper copy versus an electronic copy of the same record. This NARS effort was stimulated largely by USDA efforts which were in turn stimulated by the Forest Service (FS). New rulings from NARS may permit agencies greater flexibility in determining and using alternative methods of filing. The FS is interested in this NARS effort for its implications on whether we can use either electronic files or microfilm as storage media for official records.

Recommendation A1-2-2:

By August 30, 1985, Station Directors establish:

- a. orientation training for mail and file procedures under the CEO System,

- b. control, through Business Management Reviews, records management, and correspondence system use,
- c. delegations of authority for issuing electronic communications, and
- d. internal routing and filing procedures.

PNW - Accept.

PSW - Accept with comment. Item (a) is OK. Item (b) is unclear. What are we controlling? In item (c), is issuing of electronic communication the same as sending a note by electronic mail? We should not control electronic mail any more than we control telephone use. If "issuing" implies "directives," etc., this should be clarified.

INT - Accept with comment--Suggested rewrite: By August 1985, the Station Directors establish routing and filing procedures, delegations of authority, training programs, and a process for including control through Management Reviews.

RM - Accept with comment. Dependent on 2 above. Training should be timed with installation.

NC - Accept with comment--Should be accomplished by November, 1984.

Otherwise there could be a full year without training. Stations should already have policies for control, delegation, routing, and filing. This should not change because we will be doing it electronically.

FPL - Accept.

SO - Accept.

NE - Accept w/comment. Subitems a, b, and d will not mean much until much more equipment is available.

SE - Accept.

InS - A1-2-2, item a: Accept with comment -- InS is undertaking training sessions covering CEO electronic mail features for the WO mailroom personnel. This training will touch upon areas of electronic filing now being developed.

item b: Accept with comment -- InS should continue to assume the lead in the area of filing and correspondence system uses.

item c: Accept with comment -- InS is drafting new policy to deal with the lines of authority for handling official correspondence so that this type of correspondence receives the proper sign-offs prior to being sent.

item d: Accept with comment -- Internal routing and filing procedures will be covered in the future FSM policy on electronic filing. For example, the retention of some files in a staff account versus filing in the public files will be covered in this new policy.

Recommendation A1-3-1:

By October 1985, Chief and RF&D's identify distributed processing information needed for managing the FS.

PNW - Accept.

PSW - Accept with rewrite. As written, this implies a very static notion of information needs. If this item deals with "Information sets" to be maintained at various levels for quick retrieval, rewrite and combine with recommendations A1-6-1, A1-6-2, A1-6-3, A2-1-1, A2-1-2, A2-2-1, A2-2-1, A2-3-1, A2-3-2, A2-4-1, A2-4-2, A2-6-1, A2-7-2, and A2-7-3. We suggest that a computer specialist or systems consultant help establish the interrelationships and structures.

INT - Accept with comment--Suggested rewrite: By October 1985, Chief, Staff, and RF&D's will identify specific information needed for management decisions, and, based on these needs, will establish a level of access for each class of information.

RM - Accept.

NC - Accept with comment--Somewhat overlaps with Systems Management Review Team Action recommendation No. 1.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept.

InS - A1-3-1: Accept with reservations -- Completion of Recommendations A1-6-1 and A1-6-2 should allow the Station Directors to accomplish Recommendation A1-3-1 by October, 1985. However, the need to extend the effort to the Regional Foresters (RF) has not been formally articulated to Chief and Staff (C&S) and the RFs. Also, the October 1985 target date is very tight and would require the Chief, WO Staff, Station Directors, and especially the Regional Foresters to make it a top priority project for the third and fourth quarters of Fiscal Year (FY) 1985. In addition, part of Recommendation A1-3-1 is already included in the Chief's WO Information Requirements Project (IRP) which InS is providing support for. The Associate Chief's 6600 letter (dated 3/20/1984) directed that the IRP's results in the form of WO Information Requirements be published by April 15, 1985. InS, nonetheless, concurs with the general intent of Recommendation 6, but recommends that it be cleared with C&S and RFs. In addition, a completion date later in FY 1986 (e.g., by the summer RF&D meeting) is probably more realistic.

Recommendation A1-3-2:

By December 30, 1985, based on information needs identified, Chief and RF&D's determine level of access needed Forest Service wide.

PNW - Accept.

PSW - Accept with rewrite. It is not clear what is being addressed here -- access to system or access to specific data sets. If the latter, this will require some structure and security which can be agreed upon and maintained at the local level. Computer specialists will need to identify how networking will take place.

INT - Duplicative--The info was combined with A1-3-1.

RM - Accept.

NC - Accept with reservations--This needs to be expanded to address within and between Station access, to be determined by Station Directors.

FPL - Accept.

SO - Accept.
NE - Accept w/reservation - needs implementation date (ed. note - implementation date was added after this comment was made and is included in the latest version of recommendation.)
SE - Accept with comment - Need target date.
InS - Accept.

Recommendation A1-4-1:

By September 30, 1984, Directors at each Station establish a systems user group to address system's implementation, operating procedures, and related training and priority user access.

PNW - Accept with the assumption that such a user group's responsibilities would be fully coordinated with, and perhaps a part of, the responsibilities of the respective Stations' Systems Advisory Committees.

PSW - Reject. This appears to us to be a solution in a vacuum. Different Stations will need different organizations. We tend to think that this should be the job of computer services. Certainly a users group can't handle training and operating procedures. It can possibly help with policy issues such as who gets priority or what training is needed.

INT - Accept.

RM - Accept.

NC - Accept with comment--The recommendation does not address items in the situation statement.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept.

InS - Accept.

Recommendation A1-4-2:

By October 1, 1984, RF&D's with operational Data General systems identify experts that can assist and advise other units as they come on line. Provide list of individuals to the Deputy Chief for Administration. Assistance from the list of experts would come via team or individually as needed when the Data General equipment is installed.

PNW - Accept.

PSW - Accept with reservations. This is not a substitute for adequate staffing to get the job done. This recommendation seems somewhat redundant with first recommendation and recommendation A2-5-1.

INT - Duplicative--Combine with first recommendation.

RM - Accept.

NC - Duplication--Somewhat duplicates No.'s 1 and A2-5-1.

FPL - Accept.

SO - Accept with comment - This recommendation could be combined with Recommendations 1 and A2-5-1.

NE - Accept w/reservation - issue goes beyond coming on line, it is how to use equipment, i.e., the nuts and bolts of CEO, file handling, etc. that occupied much of time.
SE - Duplicative - Combine with A2-5-1.
InS - Accept.

Recommendation A1-5-1:

By October 1, 1985, Station Directors organize to manage information as a resource.

a. assign mail and directives management into an information systems function.

b. Strengthen telecommunications management and assign as part of an information systems function.

PNW - Accept.

PSW - Accept with comment. This recommendation seems to duplicate others such as B1-7-1, A1-2-1, and A1-2-2.

INT - Accept with comment--Suggested rewrite: By October 1985, Station Directors will adjust organizational structure so that all aspects of information networking (FLIPS, mail, telecommunications, etc.) are in one group.

RM - Accept.

NC - Accept with comment--NC plans to begin moving in this direction in FY 1985

FPL - Accept.

SO - Accept.

NE - Reject in part - Station management currently manages information as resource. This recommendation demands organizational restructure which may be inappropriate particularly w/o people qualified to lead an IS function.

SE - Accept with comment - Insert "each" before "Station Director".

InS - A1-5-1: Accept with reservations -- This recommendation is included in NSMR Actions # 1, 2, 3, et. al. Any action taken must be cleared with Associate Deputy Chief for Administration (Systems)

Recommendation A1-5-2:

By October 1, 1985, Station Directors organizationally group outyear and current year budget preparation responsibility.

PNW - Accept.

PSW - Reject in part. The concept of linking the outyear and current year budget responsibilities is good and should stay. FLIPS should be the tool by which this linkage is achieved. But this is not an organizational linkage and should not be considered as such. Whatever organizational links are needed should be left with Station Directors to determine.

INT - Reject--Different talents are needed for accounting and planning functions as well as differences between "number" management and "narrative" preparation.

RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept with reservations - The stated recommendation is acceptable but the result "Assigns budget management under one supervisor" is a concern in terms of AD-P&A responsibilities. We do not question the need for linking the outyear and current year budget preparation responsibilities.
NE - Reject - This recommendation fails to distinguish between budgeting and program budgeting. Current year budget preparation and execution is a B&F function with guidance provided by the Director. Outyear budget preparation requires a blending of programmatic, policy and political input not available in B&F staffs. The recommendations would either force B&F under the P&A AD or place the program budgeting activity under the RSS-AD.
SE - Accept with comment - Replace "organizational link" with "encourage more coordination between."

Recommendation A1-5-3:

By October 1, 1985, Station Directors study the benefits of establishing combined service units, utilizing distributed processing technologies. Include the following:

- a. scientific and technical (library) services
- b. editorial services
- c. publication management and distribution services, and
- d. contracting services

Establish units on a National or zone basis, i.e., contracting done for all Stations by one Station or for four Stations by one Station or Region.

PNW - Accept.
PSW - Accept with reservations. Are Station Directors to do this individually or as a group? Why limit this recommendation to the Stations when NFS is also involved? Distributed Processing is only a tool for use after the broader question of shared services is answered. Why is this recommendation included?
INT - Accept with comment--Suggested rewrite: By October 1985, the Deputy Chief for Research will establish teams to assess the advantages and disadvantages of combined research service units compared with combining Research Support Services with NFS.
RM - Accept.
NC - Accept with reservations--We agree in principle with this but believe the library situation is adequately being taken care of through the development of a national scientific and technical bibliographic data base and a national library network, by the WO Information Systems Staff.
FPL - Accept.
SO - Accept with comment - Combined services makes good sense but must carefully evaluate effects of loss of customized and personal services on scientific output.
NE - Reject in part - This recommendation goes far beyond distributed processing or information management per se. It assumes combined service

units will result from study. Organizational changes should be evaluated on their merit not required just because of the future presence of FLIPS. Further, there is no evidence that sufficient equipment will be available to make any reorganization feasible by October 1, 1985 or for years after. SE - Accept with reservation - We accept the premise of some of the study areas identified in the recommendations but believe the recommendation needs additional study.

Recommendation A1-5-4:

By October 1, 1985, Station Directors analyze need for current positions in Station and support management functions under a distributed processing environment (i.e., Deputy and Assistant Directors, RSS Groups and Sections).

PNW - Accept with reservation that target date is too soon for the appropriate assessments to implement this recommendation, particularly in light of FLIPS acquisition limitations in FY 84.

PSW - Accept with reservations. We can buy that Stations should review opportunities for reducing the number positions in Station management and support functions through increased efficiency by use of FLIPS. This wording suggests that the results of such a review are already known. At PSW we have already undergone significant reductions in these areas. We may decide that best strategy is hold at the current level and struggle to built back our level of service.

INT - Duplicative--This is an ongoing activity.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Reject in part - This recommendation has flawed assumptions, they are:

a. that the size of station management is a function of information flow.

b. that position savings won't be offset by increased staffing needs in systems support and information management.

SE - Rewrite. "Identify possible areas for staff reductions that will be affected by distributed processing."

Recommendation A1-5-5:

Study impact of new technologies on secretarial/clerical staff jobs and career ladders.

a. By June 1, 1985, WO PM Staff with Research develop revised roles and staffing model guidelines for clerical positions assuming full availability of distributed processing technologies. Use task force that includes personnel specialists/classifiers and clerical staff.

b. By September 30, 1985, Stations Directors implement new secretarial/clerical guidelines once they are completed.

PNW - Accept with comment. Administrative careers should be included.
PSW - Accept with comment. As Stations begin working with FLIPS, PD's can be revised on an "as needed" basis and guidelines can be established.
INT - Accept with comment--Suggested rewrite: By June 1985, WO-PM staff, with Research input, will develop revised roles and staffing models for clerical positions assuming full availability of distributed processing technologies.
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept with comment - Assumes we can break out of the GS-5/6 secretary syndrome and redefine the jobs to open up grades.
NE - -accept part a. but decision on part b. should be deferred until results of part a. are analyzed.
SE - Accept with reservation - Dates appear unrealistic.

Recommendation A1-6-1:

By September 1984, Deputy Chief for Research establish a task group of Station administration and scientific support representatives to evaluate, define, and prioritize a core set of Station level information needs.(Ref.Issue A1-3.)

PNW - Accept.
PSW - Accept with rewrite. We suggest that this recommendation might be combined with recommendations A1-3-1, A1-6-1, A1-6-2, A2-1-2, A2-2-1, A2-2-2, A2-3-1, A2-3-2, A2-4-1, A2-4-2, A2-7-2, A2-7-3
INT - Duplicative--Refer to #A1-3-1.
RM - Accept.
NC - Reject in part--Recommendation No. 6 provides for a negotiation between the WO and Station Directors to identify a core set of information each Station needs to maintain for distribution to the WO. Then, each Station, individually, needs to identify its core information needs. This should be negotiated by the Station headquarters with its field locations. The information needs structure for the Forest Service should represent a pyramid where each organizational level negotiates with the next lower level for its information needs.
FPL - Accept.
SO - Accept with comment - This recommendation should be combined with Recommendation A2-6-1.
NE - Accept
SE - Duplicative - Combine with A1-6-2.
InS - Accept.

Recommendation A1-6-2:

By April 1985, Task Group (cf. Recommendation A1-6-1) present recommendations to Deputy Chiefs for Research and Administration.

PNW - Accept.
PSW - Accept with rewrite. See comment for recommendation A1-6-1.

INT - Reject--"What" is in A1-3-1, "how" is up to Chief and Staff.
RM - Accept.
NC - Accept with comment--See recommendation A1-6-1.
FPL - Duplicative. Appears to be part of A1-6-1.
SO - Accept.
NE - Accept.
SE - - See A1-6-1.
InS - A1-6-2: Accept with comment -- The Task Group's evaluation, definition, and rank ordering of a core set of Station level information needs would help to accomplish Recommendation A1-3-1.

Recommendation A1-6-3:

By April 15, 1985, WO Staffs evaluate and report the need for official FS forms, as well as, the process requiring them, in light of distributed processing. This should be in conjunction with the effort to identify Chief's Office (National) data and information requirements.

PNW - Accept.
PSW - Accept with rewrite. See comment for recommendation A1-6-1.
INT - Duplicative--This should be handled in A1-3-1.
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept.
NE - Accept.
SE - Accept.
InS - A1-6-3: Duplicative -- Plans are already underway to update the Forms Management Program to include new policy and procedures needed for distributive processing. A review of Service-wide FS forms and reports is also scheduled to begin in July 1984 to identify those that can be consolidated, revised, or obsoleted. This review will include identifying forms and reports used in distributive processing.

Recommendation A1-6-4:

By October 15, 1984, WO InS develop necessary policy, standards, and processes for creating, using, and maintaining electronic forms--including controls and security. This should be in conjunction with Action Item #1 of the Draft SRT Implementation Plan.

PNW - Accept.
PSW - Accept with comment. Can this be combined with recommendation A1-6-3?
INT - Accept.
RM - Accept.
NC - Accept.
FPL - Accept with comment. It is doubtful that this can be done by October, unless it is already underway.
SO - Accept with comment - in conjunction with Recommendations A1-6-3

and A1-6-4, Stations should evaluate their internal forms and take appropriate action.

NE - Accept.

SE - Accept.

InS - A1-6-4: Duplicative -- Our reply to Recommendation A1-6-3 also applies here.

Recommendation A1-6-5:

By December 30, 1984, Deputy Chiefs assign the responsibility for studying the conversion of FS forms, from hardcopy to electronic, among the Regions and Stations.

PNW - Accept with reservation that for consistency a task force might be more efficient than scattering portions of this task among Stations and Regions.

PSW - Accept with rewrite. Suggest adding a date. Recommendation 18 seems to provide for study. Perhaps the issue here is whether to accept the results of such a study and, if they are accepted, to implement them?

INT - Reject--If A1-3-1 and A1-6-4 are accomplished, we can implement without more study.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept with comment - Needs target date.

InS - A1-6-5: Duplicative -- Our reply to Recommendation A1-6-3 also applies here. In addition, the conversion of Service-wide FS forms from hard copy to electronic format will be part of the new FSM policy being developed on electronic filing (see our reply to Recommendation A1-2-1, items a and b).

Recommendation A1-7-1:

By June 1985, WO CS&T Staff give high priority to reviewing and revising FSM 6620 and related handbooks (standards for software development, validation, and documentation) to reflect the distributed processing environment.

PNW - Accept - reference also B2-1-1, B2-1-2, B2-1-3, B2-1-4, B2-1-5.

PSW - Accept with comment. We need input from users into the documentation standards. From a users standpoint, current software documentation is lousy. This, of course, protects the empires of the white-robed priests of Data Processing.

INT - Accept.

RM - Accept.

NC - Accept with comment--Needs to be coordinated with B2-1-2.

FPL - Accept with comment. Should be reworded to state ". . .WO CS&T Staff review and revise FSM 6620. . ."

SO - Accept.
NE - Accept w/reservation - should exclude development of software involved in research or development process.
SE - Accept with comment - Delete "give high priority to".

Recommendation A1-7-2:

By October 1984, WO CS&T Staff establish a task group to develop a communication mechanism for sharing software applications and needs such as:

- a. National library for software exchange (See Action Item #10 of the SRT Draft Implementation Plan).
- b. FLIPS Conference System.
- c. Software information workshops.
- d. Newsletter.

PNW - Accept - reference also B2-1-1,B2-1-2,B2-1-3,B2-1-4,B2-1-5.

PSW - Accept with reservations. The costs of developing and maintaining a software library needs to be carefully considered.. Unless the library is up-to-date and readily accessible to users, it probably won't be used at all.

To make this recommendation work will require a large committment of resources. Is it worth it? All previous efforts have failed due to insufficient resources.

INT - Accept.

RM - Accept.

NC - Duplicative--NSMR Action Plan recommendation No. 14 addresses this concern. A FLIPS conference is already up and running which may replace the need for a newsletter. Should also be coordinated with B2-1-5.

FPL - Accept.

SO - Accept.

NE - Accept w/reservation - should add caveat to keep it simple, cheap and require very limited staff time.

SE - Accept.

Recommendation A1-7-3:

By July 1984, Deputy Chief for Research evaluate the need for and request authority to purchase standardized software packages that are unique to research administration and scientific support processes. For example, software such as MINITAB, SAS, and Scientific Notation.

PNW - Accept - reference also B2-1-1,B2-1-2,B2-1-3,B2-1-4,B2-1-5.

PSW - Accept with reservations. We must show restraint if given the authority or we will lose credibility. Cost/benefit analysis should be used to determine the needs for supplying this software to individual systems. It may be more cost effective to use remote access techniques for low use sites.

INT - Accept with comment--Delete the words "evaluate the need for and." This should read, "...will request authority...."

RM - Accept.
NC - Accept.
FPL - Accept with comment. Is completion date correct?
SO - Accept.
NE - Accept.
SE - Accept.

Recommendation A2-1-1:

Delete the following forms from the FY 1987 budget instructions:

Form IA - Priorities for funding decreases.
Form IB - Priorities for funding increases.
Form IE - Increment/Decrement RWU Summary.
Form II - Research construction.
Form III - Safety and Health Construction Projects.
Form IV - FLIPS Expenditures.
Form V - TT Projects.

Current forms to be maintained are:

Form IC - Program narrative
Form ID - Increment/Decrement BLI Summary
Appendix N-2 - General Administration

This is assigned to the Deputy Chief for completion by October 1, 1984.

PNW - Accept - reference A1-6-1, A1-6-2, A1-6-3, A1-5-4, A1-6-5 for duplication/coordination.

PSW - Accept.

INT - Accept with comment--Combine with A2-1-2.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept with comment - Station volunteers Jerry Sesco to assist in implementing this recommendation.

Recommendation A2-1-2:

Information/data required to generate the forms deleted in A2-1-2 above will be maintained and kept current by the Stations in a standard format to be submitted electronically in later stages of the budget process as needed. This system will be designed by PSW Station in cooperation with the Deputy Chief's office. Before implementation this format will be reviewed by all Stations. Completion date is November 1, 1984.

PNW - Accept - reference A1-6-1, A1-6-2, A1-6-3, A1-5-4, A1-6-5 for duplication/coordination.

PSW - Accept with reservations. We'll need the revised and integrated spread sheet program if we are to discharge this obligation.

INT - Accept with comment--Combine with A2-1-1.

RM - Accept.

NC - Accept.
FPL - Accept.
SO - Accept.
NE - Accept with reservation - The term kept current needs to be defined. Does this mean daily? weekly? monthly? trimonthly? I suggest that the Stations should be responsible to have the information current on dates specified by W.O. and based on the budget process.
SE - Accept.

Recommendation A2-2-1:

Create a budget execution data base in lieu of preparing Forms 6500-33 and 6500-35 and incorporate in the data base a process to capture special report needs generated by the annual budget cycle. (Example: Special interest items in the "Book of Notes.") The Deputy Chief's office will have the system designed by September 15, 1984, and implemented by December 1, 1984.

PNW - Accept - reference A1-6-1, A1-6-2, A1-6-3, A1-5-4, A1-6-5 for duplication/coordination.

PSW - Accept with comment. The whole issue of "data Sets" should probably be addressed as one coherent package. This would include recommendations A1-3-1, A1-6-1, A1-6-2, A1-6-3, A2-6-1.

INT - Accept.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept.

InS - A2-2-1: Accept with comment -- Since Forms FS-6500-33 and FS-6500-35 are submitted annually to PD&B as part of Report FS-6500-AY, Station Financial Plans, this recommendation needs to be coordinated with PD&B. Also any change in the status of these forms or this reporting requirement needs to be cleared with InS's Directives Group as part of its Forms and Reports Management programs.

Recommendation A2-2-2:

Provide Station (allocation) and appropriation level data to the Station through creation of a data base which will replace State sheets and budget activity sheets. The Deputy Chief's office will implement by December 1, 1984.

PNW - Accept - reference A1-6-1, A1-6-2, A1-6-3, A1-5-4, A1-6-5 for duplication/coordination.

PSW - Accept with comment. See recommendation A2-2-1.

INT - Accept.

RM - Accept.

NC - Accept.

FPL - Accept.
SO - Accept.
NE - Accept.
SE - Accept.

Recommendation A2-3-1:

RM Station will take the lead with input from other Stations and the WO to develop and define the minimum construction data needs. Once these needs have been identified, a draft of the data elements and proposed data base design will be provided to the Stations for comment. This will be accomplished by October 1, 1984, with implementation planned for January 1, 1985.

PNW - Accept with reservation; this appears an integral part of A2-6-1.
PSW - Accept with comment. See recommendation A2-2-1.
INT - Accept with comment--Combine with A2-3-2.
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept.
NE - Accept.
SE - Accept with comment - Possibly combine with A2-3-2.
InS - A2-3-1: Accept with comment -- RM Station Project results should also be presented to the Deputy Chief for Administration for evaluation.

Recommendation A2-3-2:

RM will take the lead with input from other Stations and the WO to develop common data elements which are needed by managers in planning for maintenance of facilities; e.g., condition surveys, project work plans, and the need for maintenance plans. A draft proposal will be available for review by October 1, 1984. This will be in final format by January 1, 1985.

PNW - Accept with same reservation as prior item. Why not incorporate A2-3-1 and 2 with item A2-6?
PSW - Accept with comment. See recommendation A2-2-1.
INT - Accept with comment--Combine with A2-3-1.
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept.
NE - Accept.
SE - Accept.
InS - A2-3-2: Accept with comment -- RM Station Project results should also be presented to the Deputy Chief for Administration for evaluation.

Recommendation A2-4-1:

The Deputy Chief's office utilize where possible information available from the core data base (see Issue/Problem A2- 6), budget, personnel, and other functional data bases.

PNW - Accept.
PSW - Accept with comment. See recommendation A2-2-1.
INT - Reject--May also be duplicative.
RM - Accept.
NC - Accept.
FPL - Reject. Unnecessary, since it is understood as part of No. A2-6-1.
SO - Accept.
NE - Accept.
SE - Reject - This item is contained in A2-6-1.
InS - Accept.

Recommendation A2-4-2:

The Deputy Chief's office provide feedback to Stations on program management information needs. The Stations can better prepare and respond to specialized requests if more is known about the nature of requests received by the WO.

PNW - Accept.
PSW - Accept with comment. See recommendation A2-2-1.
INT - Reject--If the weather forecaster has difficulty with one-day projections, how can we predict information requests?
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept.
NE - Accept - Supposedly program management information needs were specified and agreed upon in A1-6-1, A2-1-1, and A2-6-1.
SE - Accept - No Action.
InS - Accept.

Recommendation A2-5-1

Stations will prepare an inventory of current programs, skills, and resources in distributed processing, which will be used as a basis for initiating the sharing of skills among Stations. This will be submitted to the Deputy Chief's office by September 15, 1984 (call letter will be issued).

PNW - Accept (reference also general recommendation no. 1).
PSW - Accept with reservations. We need to guard against the concept that one or two Stations will become the ADP skill pool(s) for other stations. This recommendation should be rewritten with this thought in mind.
INT - Duplicative--See #1.

RM - Accept.
NC - Accept with comment--Coordinate with No. 1.
FPL - Duplicative. Duplicates No. 1.
SO - Accept.
NE - Accept.
SE - Duplicative - Combine with A1-4-2.

Recommendation A2-6-1:

The NE Station will take the lead with input from other Stations and the WO to develop the data elements to be included in a Research core data base and propose the data base structure prior to October 15, 1984. The following standards will be used in defining the elements:

1. There must be a specific established need for each element of data.
2. Every Station must maintain up-to-date data.
3. Data must be standard and common to all units.
4. Data must not be administratively confidential.
5. Files must be flexible.
6. Core data files must be accessible to all research units.

Kinds of Data:

Personnel:

1. No of scientists by highest degree held.
2. No. of research professionals by highest degree held.
3. Advanced training.
4. Name of employee by location; i.e., position structure, position title, grade, and salary.

Program:

1. All data elements.
2. Attainment reports.

Financial Data:

1. Current financial allocations summaries.
2. Station financial plans; current year:
 - a. RWU #, project leader's name
 - b. Location
 - c. Title
 - d. SY's
 - e. Funds by budget activity
 - f. Other appropriated funds
4. Budget year appropriations by RWU.
5. Current year appropriations by RWU #.
6. Historical years appropriations by RWU#.

Physical Plant Data:

1. Location.
2. Ownership: FS, leased, Univ. provide
3. Type: Lab, lab/office, storage: square footage
4. Staffing capacity. Current staffing, FS and cooperators, by affiliation.
5. Year built.
6. On-campus/near campus.
7. Major facilities needs.

8. Minor construction needs.
9. Experimental forests and ranges:
Names, location, acreage, ownership, date established,
biological significance.

PNW - Accept.

PSW - Reject in part. Several of our reviewers have difficulty with "Core data files must be accessible to all research units." Not the least of the problems is that this would destroy current security unless this "core" was maintained separately at individual locations. Development of the structure to achieve the ends hoped for under this recommendation will require the talents of top-notch system designers, either within the FS or consultants.

INT - Accept with comment--Only the first sentence is a recommendation. The background material should be in the text.

RM - Accept.

NC - Accept with reservation--Due date is unrealistic by 18 months or more for completion. This will be a very big job to get agreement, set up system, test, and implement. Also need to coordinate with No. A1-2-1.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept.

InS - A2-6-1: Accept with comment -- NE Station Project results should also be presented to the Deputy Chief for Administration for evaluation.

Recommendation A2-7-1:

The Deputy Chief of Research should appoint a Task Force composed of representatives of WO Staffs and Stations, to evaluate the essential needs, efficiency, and usefulness of the information submitted in the current reporting process. Report due January 1, 1985.

PNW - Accept - coordinate with recommendations A1-6-3, A1-6-4, and A1-6-5.

PSW - Accept with rewrite. It isn't clear what is included in "current reporting process."

INT - Accept with comment--Suggested rewrite: By January 1985, the Deputy Chief for Research will appoint a task force, with WO Staff and Station representation, to identify the essential needs of the Research Attainment Report and develop methodology necessary for electronic transmission.

RM - Accept.

NC - Accept with comment--We agree, but tends to duplicate recommendation No. A1-3-1 and all other recommendations that define information needs.

FPL - Duplicative. Duplicates No. A1-3-1.

SO - Accept.

NE - Accept.

SE - Duplicative - Combine with A2-7-2 and A2-7-3.

InS - A2-7-1: Duplicative -- This recommendations falls under FSM 1380, Reports Management. A review of Service-wide FS forms and reports is

scheduled to begin in July 1984 to identify those that can be consolidated, revised, or obsoleted. This review will include identifying forms and reports used in distributive processing.

Recommendation A2-7-2:

The Task Force will recommend a standard attainment report "data base" of Form I information that allows for electronic transmission and storage of highlights and Form II information. Due January 1, 1985.

PNW - Accept - coordinate with recommendations A1-6-3, A1-6-4, and A1-6-5.
PSW - Accept with comment. Consider combining with recommendation A2-7-1.
INT - Duplicative--See A2-7-1.
RM - Accept.
NC - Accept with comment--Must coordinate with No. A2-6-1.
FPL - Accept.
SO - Accept.
NE - Accept.
SE - see above
InS - Accept.

Recommendation A2-7-3:

CRIS reporting be a part of the 1985 Research Attainment Report data file.

PNW - Accept - coordinate with recommendations A1-6-3, A1-6-4, and A1-6-5.
PSW - Accept with comment. Consider combining with recommendation A2-7-1.
INT - Accept.
RM - Accept.
NC - Accept with comment--Assures USDA will agree to accept FS CRIS Bibliography in ANSI format. This will probably not be easy and "1985" is not realistic.
FPL - Accept.
SO - Accept.
NE - Accept.
SE - See above.
InS - Accept.

Recommendation A2-7-4:

Recommend support for ongoing efforts to standardize the FS bibliographic base. The standard base should serve the Attainment and CRIS reporting process.

PNW - Accept.
PSW - Accept with reservations. What does support mean--money, chief's

approval, staff approval, or what? Ongoing efforts are now in InS hands. Following the New York meeting of FS librarians, study groups are preparing materials for InS follow-up of Chief and Staff direction in April to study WESTFORNET/SOUTHFORNET and come up with a proposal to Chief and Staff by September 1, 1984.

INT - Accept with comment--Combine with B2-3-1.

RM - Accept.

NC - Accept with comment--Coordinate with No. B2-3-1.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept with comment - Needs target date.

InS - A2-7-4: Accept with comment -- This should be accomplished through NSMR Action # 18.

Recommendation B1-1-1:

Stations and FPL should continue to provide centralized service to scientists for literature searching needs.

PNW - Accept.

PSW - Accept.

INT - Duplicative--Already being done.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept with comment - Need to know where we are going with library services in a distributed processing environment before implementing this recommendation.

InS - B1-1-1: Accept

Recommendation B1-1-2:

Stations and FPL should review their literature search process to assess whether distributed processing can facilitate current procedures.

PNW - Accept.

PSW - Accept with reservations. In effect, we've done this. We're already down-loading literature searches from commercial vendors into FLIPS and thus delivering the search results instantly to the scientist in his lab or office. We can do this with almost any terminal or printing unit.

INT - Reject--Let it happen without requiring recommendation followup reports.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.
SE - Accept with comment - See B1-1-1.
InS - B1-1-2: Accept with comment -- This recommendation also should be closely tied to NSMR Action # 18.

Recommendation B1-1-3:

Stations and FPL should develop an awareness of literature search capabilities and communicate new procedures to scientists.

PNW - Accept.
PSW - Accept with no action. Sure, we can train our scientists in how to do on-line searches. Then we'll have a semi-trained cadre of on-line searchers who'll be doing searches at a much higher cost and lower efficiency than if they are done by an experienced on-line searcher. Also, the scientists will be searching rather than doing research.
INT - Reject--See B1-1-2.
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept.
NE - Accept w/comment - some Stations have full awareness of lit. search capabilities.
SE - Accept with comment - See B1-1-1.
InS - B1-1-3: Accept

Recommendation B1-2-1:

Adequate hardware and software be provided to RWU for routine data collection, handling, and analytical needs.

PNW - Rewrite? The RWU's need the opportunity and freedom to acquire flexible hardware and software to meet their particular needs.
PSW - Accept with comment. This should be expanded to include the availability of external ADP sources for major "data crunching." This seems redundant with recommendation A1-7-2. Does it conflict with first recommendation and recommendation A1-1-1?
INT - Duplicative--See B1-2-3.
RM - Accept.
NC - Accept with comment--May be duplicating somewhat No.'s A1-1-1 and A1-7-3.
FPL - Accept with comment. This is basically a "motherhood" statement and may not need to be mentioned.
SO - Accept.
NE - Accept w/comment - B1-2 assumes erroneously that FLIPS will be used for everything including data logging which is not a good use of FLIPS when small machines can do it.
SE - Combine with B1-2-2, B1-2-3, and B1-2-4. We see these four recommendations as addressing one issue--how distributed processing will be used by RWU's.

Recommendation B1-2-2:

Allocation of distributed processing hardware and software be responsive to local need so that RWU's can most efficiently accomplish their missions.

PNW - Accept, but again the key words would seem to be freedom and flexibility to acquire systems materials needed locally.

PSW - Accept.

INT - Duplicative--See #B1-2-3.

RM - Accept.

NC - Accept with reservations--The FS must satisfy the requirements expressed by Congress before we go heavily into data handling and analysis. Also, the use of FLIPS equipment must be managed in order to be responsive to total Station needs.

FPL - Accept with comment. Same as No. B1-2-1 above.

SO - Accept.

NE - Accept.

SE - See B1-2-1.

Recommendation B1-2-3:

Although use of distributed processing for data handling and analyses should be encouraged, RWU should not be restricted to its use. Forest Service policy should permit the use or purchase of hardware and/or software necessary to meet specialized data processing needs.

PNW - Accept.

PSW - Accept with reservations. This seems to conflict with recommendation A1-1-1. Exceptions should be approved only with solid justifications.

INT - Accept with comment--Suggested rewrite: By December 1984, the Deputy Chief for Research will develop an attitude (policy) statement that RWU's will not be restricted to Data General hardware and that authority will be delegated to the Station Directors to acquire adequate hardware and software for data collection, storage, and analysis.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept with comment - There may be some confusion in this and related recommendations over the term "distributed processing hardware." As used here, the meaning seems to be Data General (FLIPS) equipment. We are effectively using other brands of equipment for distributed processing and in some cases to compliment and support the Data General Equipment.

NE - Accept.

SE - See B1-2-1.

Recommendation B1-2-4:

RWU's be allowed to continue to use present automated data processing equipment, and justifiable updates should be allowed. Such systems should be phased out only when the distributed processing system has been shown to do the job more efficiently and at lower costs.

PNW - Accept with reservation that a related cost analysis might incorporate indirect effects. That is, the FLIPS equipment may be deemed most cost efficient because of communication links with other users of the data or documents generated.

PSW - Accept with reservations. Seems to conflict with recommendation 1. One of our reviewers commented, "Baloney."

INT - Duplicative--See #B1-2-3.

RM - Accept.

NC - Accept with comment--Needs to be coordinated with No. A1-1-2.

FPL - Accept with comment. The wording here may correlate with A1-1-2.

SO - Accept.

NE - Accept.

SE - See B1-2-1.

Recommendation B1-3-1:

Each user should be provided with the necessary level of security to prevent unauthorized access to files.

PNW - Accept.

PSW - Accept.

INT - Accept with comment--Suggested rewrite: By April 1985, each Station Director will provide FLIPS users with the necessary level of security to prevent unauthorized access to files.

RM - Accept.

NC - Accept with no action--This is part of the FLIPS system and no action is necessary.

FPL - Duplicative. Duplicates No. A1-3-2.

SO - Accept with comment - In order to deter unauthorized access to files, there needs to be appropriate consequences and penalties for violators.

NE - Accept.

SE - Accept - No action required; already in place as a result of Data General contract.

Recommendation B1-3-2:

There should be clarification concerning how the FOIA affects electronic security.

PNW - Accept.

PSW - Accept.

INT - Accept with comment--Suggested rewrite: By April 1985, WO will provide clarification concerning how the FOIA affects electronic security.

RM - Accept.
NC - Accept.
FPL - Accept with comment. Should be combined with No. A1-3-2.
SO - Accept.
NE - Accept.
SE - Reject - Existing FOIA regulations regarding electronic security are already clearly defined.

Recommendation B1-3-3:

A system for master access be provided to guard against information losses.

PNW - Accept.
PSW - Accept with rewrite. Suggest, "System documentation of datasets in computers needs to be maintained by scientists so that information can be retrieved by others with the appropriate approvals." This is probably already covered in the FLIPS contract, at least to insure that data can be accessed and recovered if a key individual dies or otherwise becomes unable to access his own data.
INT - Accept with comment--By April 1985, the Deputy Chief for Research will appoint a small task force to develop a security documentation procedure for major data bases which includes a master access plan to guard against information losses.
RM - Accept.
NC - Accept with no action--This is part of the FLIPS system and no action is necessary.
FPL - Accept with comment. See B1-3-2.
SO - Accept with comment - Same comment as B1-3-1.
NE - Rewrite - master access already exists.
SE - Accept - See B1-3-1.

Recommendation B1-3-4:

Security documentation is needed for major data bases.

PNW - Accept.
PSW - Accept with comment. As we interpret this, it seems so obvious that it hardly needs to be said. Are we missing something?
INT - Duplicative--Combine with #B1-3-3.
RM - Accept.
NC - Accept with reservation--Does this mean there should be documentation on the format and meaning of each data element, or that a scheme of security access procedures be available for these data bases? If the former, this should be normal routine for any data. If the latter, the FLIPS system provides for such procedures.
FPL - Accept with comment. See B1-3-2.
SO - Accept.
NE - Accept.
SE - Accept - See B1-3-1.

Recommendation B1-4-1:

The Chief and Staff should appoint a task group to explore organizational changes that will assign responsibility, staffing, and funding for the development, maintenance, and support of computer-assisted resource management procedures that will exploit the capability of distributed processing.

PNW - Duplication of A1-5-3, A1-5-4, and A1-5-5, among others. Such a task force may be useful at some future time, but until there has been an adequate "shakedown" and learning stage, it is difficult to assess the need or value of this proposal.

PSW - Reject. If we read this correctly, this recommendation deals with the research task of developing software for land managers. If so, we think the strategy for accomplishing this task can be done within current procedures for planning and implementing research. We see no reason to explore organizational changes.

INT - Accept.

RM - Accept.

NC - Accept with reservation--The level of organizational changes to be explored should be identified.

FPL - Accept.

SO - Accept with reservations - This recommendation as well as numbers B1-4-2 through B1-4-4 cover the same general area as recommendations B2-1-2 through B2-1-6. They also overlap recommendations in the SRT B-3 report. They need to be merged considering the somewhat different concerns and priorities expressed in the individual recommendations.

NE - Reject.

SE - Accept- No Action.

Recommendation B1-4-2:

Deputy Chiefs assign a group to recommend procedures to monitor and control what computer-assisted resource management procedures are established, what modifications are made, and to what extent extrapolation is permitted beyond the populations and settings used in their development.

PNW - Rewrite or reject. This recommendation is not clear in its intent, appears restrictive of creative energies focused on FLIPS application, and may be inappropriate for some of the same reasons as listed in number B1-4-1.

PSW - Accept with reservations. One reviewer recommended that this recommendation be rejected because this is already part of Hartgraves' job. However, other reviewers felt that the real issue here is that the development of software packages for resource management is neither traditional research nor traditional resource management. Instead, it is an activity that tends to "fall between the chairs" for lack of specific funding, staffing, and assignment of responsibility.

INT - Accept with comment--Combine with #B2-1-2.
RM - Accept.
NC - Rewrite--Needs clarification to improve understanding. We do not do this now for publications, so why should it be done for resource management procedures?
FPL - Duplicative. Should be combined with No. B1-4-1.
SO - Accept with reservations - See above comment.
NE - Reject in part - Need to avoid a group having veto power over research ideas for software such as the old systems Review Committee had.
SE - Accept - No action.

Recommendation B1-4-3:

Deputy Chief for Research assign a group to recommend policy defining who will support research-developed software (i.e., who will respond to user questions and training needs, incorporate improvements, modify programs to fit new hardware systems, etc.)

PNW - Accept with assumption this task be incorporated into the set of responsibilities assigned the task group recommended in no. A1-7-2.
PSW - Accept with reservations. We tend to think that this, also, is part of Hartgraves job.
INT - Accept.
RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept with reservations - See prior comment.
NE - Accept w/reservation - Deputy Chief for S&PF should be involved as well as for NFS.
SE - Accept with reservation - Group should include non-researchers, i.e., NFS and S&PF employees. This is really just another technology transfer problem.

Recommendation B1-4-4:

Chief and Staff select a task force, preferably including outside management consultants conversant with high-technology corporations, to examine the impact and adequacy of our reward systems for getting useful research results, carrying them forward into proven technologies, and getting the technologies into practice. (As a start, see "Research rewards in the Forest Service, by Albert J. Simard, North Central Station.)

PNW - Reject. This recommendation has merit, but is inappropriate in the context of the FLIPS workshop and related recommendations.
PSW - Accept with comments. We think this is an important recommendation. Many research results are not useful until transferred into usable technologies. Even then, practitioners may have little incentive for change. Reward systems are critical in shaping what is perceived as important to do.

INT - Reject--Perceived as a dig at the panel evaluation system, and we are the system.
RM - Reject. The recommendation is valid in and of itself, but has no direct bearing on distributed processing. It should be more appropriately addressed by personnel studies/task forces.
NC - Accept with comment--We suggest that Al Simard become a member of this Task Force.
FPL - Accept.
SO - Accept with reservations - See prior comment.
NE - Reject.
SE - Reject - This recommendation is unrelated to the information management system.

Recommendation B1-5-1:

Small task forces be formed in those research functions that have responsibility for regional or national resource information to establish criteria for compatability among data sets and explore the potential use of distributed processing to facilitate the process.

PNW - Accept with no action. The recommendation here should be enough, because this kind of standardization is likely already being addressed where appropriate. To pronounce a decree on the issue could result in some "overdoing" in this area with a "tail-wagging-the-dog" effect.

PSW - Accept with comment. The requirement to establish criteria for use in maintaining file structures appears to go too far in dictating structures to scientists. It might be better to simply require some form of system documentation of data sets. Independent research may not lend itself to similar datasets.

INT - Accept.

RM - Accept with comment. This seems to be the most logical application of distributed processing in the research environment and should have top priority to assist in the 1989 RPA Assessment which is heavily impacting project 4101.

NC - Accept with comment--If the eastern-wide network of Forest Inventory and Analysis RWU's is still anticipated, it should begin with these units.

Consider having one task force for No.'s B1-4-3, B1-4-4, and B1-5-1 with work groups to handle specific issues.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept with comment - Needs target date.

InS - B1-5-1: Accept with comment -- Task forces' results should also be presented to the Deputy Chief for Administration for evaluation.

Recommendation B1-6-1:

Station Directors, Assistant Directors, and Project Leaders allocate available distributive processing resources among RWU scientists and staff

by criteria that seek to optimize Station management and scientific productivity.

PNW - Accept, but top priority will be retained for communications use by management.

PSW - Accept with comment. One of our scientists comments, "The bottom line for research is research productivity. Station management is a means to this end. We need to capture this idea."

INT - Reject--This is a standard management responsibility.

RM - Accept.

NC - Reject--This is somewhat duplicative of No. B1-2-2, but should be unnecessary. Why should we want to do otherwise?

FPL - Duplicative. Duplicates No. B1-2-2.

SO - Accept.

NE - Accept.

SE - Accept - No action. See A1-5-1, A1-5-2, and A1-5-3.

Recommendation B1-7-1:

Station Directors, Assistant Directors, and Project Leaders should evaluate alternative organization structures in light of RWU needs and their respective distributed processing capabilities.

PNW - Accept (reference also A1-5-3, A1-5-4, A1-5-5, and B1-4-1).

PSW - Accept.

INT - Duplicative--This is an ongoing effort and will be influenced by the outcome of several other recommendations.

RM - Accept.

NC - Accept with comment--Consider integrating action on this recommendation along with No.'s A1-5-1 and A1-5-3.

FPL - Accept with comment. Should be combined with No. B1-4-1.

SO - Duplicative - Merge with Recommendations A1-5-3, A1-5-4, and A1-5-5.

NE - Rewrite - Need elaboration, it's not clear what kinds of complications would require organizational restructuring.

SE - Duplicative - Combine with B1-8-1.

Recommendation B1-8-1:

- "On location" operating systems expertise must be provided through either staffing, training, or shared services.

- Provision should be made by the Station Director for consulting a network of experienced users.

PNW - Accept.

PSW - Accept.

INT - Duplicative--Combine with #1.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Duplicative - Merge with Recommendations A1-4-1 and A1-4-2.
NE - Accept.
SE - See B1-7-1.

Recommendation B1-9-1:

-Managers and scientists should constantly anticipate changes in research needs.
-Deputy Chief for Research and Station Directors should issue guidance for establishing criteria for determining appropriate responses to requests.

PNW - Accept.

PSW - Accept with reservations. One reviewer commented that this is either a motherhood statement or silly. Another suggested that it be rewritten to say, "FLIPS technology should not detract from the amount of effort given by scientists to their research. Administrative or reporting needs should not be increased because of new technologies. Additional requests for information from scientist should be approved by the Station Director."

INT - Accept with comment--Suggested rewrite: Station directors will establish criteria and line authority for responding to requests resulting from distributed processing, and continue to monitor the process.

RM - Accept.

NC - Accept with comment--But doesn't this really go without saying?

FPL - Accept with no action.

SO - Accept with comment - We must be careful that we don't go chasing every new 'need' that is identified and dilute our efforts.

NE - Reject - current mechanisms for deciding research priorities will continue in place.

SE - Accept - No action.

Recommendation B1-10-1:

Station Directors need to consider and prioritize these opportunities for use of distributed processing in GA areas:

-Real-time access to budget status for the RWU.

-Real-time attainment reporting.

-Automated "promise cards" including cuing systems.

-Automated "templates" for RFP's, PO's, T&A's, etc.

-Property inventory.

-Personnel files (except sensitive data).

-Annotated electronic shopping lists of courses and tools for training.

PNW - Accept with consideration this recommendation duplicates others (reference A1-2-1, A1-3-2, and A2-6-1, among others).

PSW - Accept with comments. This list could be easily expanded.

INT - Reject--Some of these items are already covered; some will just happen.

RM - Accept.

NC - Accept with reservation--The term "real-time" probably should be

replaced by "on-line".

FPL - Accept.

SO - Duplicative - Covered in other recommendations.

NE - Accept.

SE - Accept with comment - Consider this recommendation in tandem with A1-6-1 and A2-6-1.

Recommendation B1-11-1:

-Project Leaders develop guidelines for appropriate use of distributed processing.

-Criteria should be established for determining relevant response areas for information and research--provisions are needed to protect scientists from requests that could be handled elsewhere.

-Limits should be set for the number of reviewers for a given document and responsibilities assigned to key reviewers to assure quality responses.

-Administrative response requests should be restricted to selected scientists and staff.

PNW - Reject in part. No further limits should be set for document review. Management should retain its prerogative to establish levels of review appropriate to the document.

PSW - Accept with reservations. We're not at all sure why PL's should be the ones to develop guidelines for the appropriate use of distributed processing. Why limits on the number of reviewers is included in this document is beyond us. We don't understand what is being addressed in the last items.

INT - Accept with comment--Suggested rewrite: As hardware is acquired, Project Leaders will develop guidelines for the appropriate scientific use of distributed processing.

RM - Accept.

NC - Accept with reservation--There is some duplication with recommendations No. A1-3-1 and A2-4-2. Why would we want to limit the number of reviewers? Shouldn't we be trying to eliminate a "shotgun" approach to document review instead? We need to be careful not to alienate some of our cooperators or fellow scientists who may feel they are being left out of the process or not being kept informed. Distributed processing should not change the basic approach to this problem.

FPL - Accept with no action. Concepts are acceptable, but verification impossible.

SO - Accept with comment - This recommendation is covered by other recommendations but the concerns and need for involvement at the RWU level needs to be highlighted.

NE - Accept w/comment - too many subelements here. I am not sure the P.L. is the appropriate person to develop guidelines as there are individuals and individual situations that require flexibility.

SE - Accept with comment - At the end of first sentence add "with the RWU".

Recommendation B1-12-1:

-Station Directors use distributed processing to maintain a real-time "preliminary" budget and fiscal information base at the RWU level, subject to final reconciliation with NFC.

-Task forces that are given the job to design management support systems should include staff, scientists, and decisionmakers from all RWU/Station levels; and that commercially available forms of software (e.g., spread sheets) be used before new programs are written.

PNW - Accept policy with rewording. This recommendation pertains to current year budget, although the words "preliminary budget" imply the President's Budget for outyears. This recommendation is duplicative of B1-10-1.

PSW - Accept with comments. Acceptance here implies acceptance of the need to maintain "cuff records."

INT - Duplicative--National administrative review teams are already including this need.

RM - Accept.

NC - Rewrite--We agree with this recommendation but the first statement needs to be clarified to improve understanding. Do we want to say "project leader" instead of "Station Director?"

FPL - Duplicative. Duplicates Nos. B1-10-1 and A1-6-1.

SO - Accept.

NE - Accept.

SE - Accept with comment - In tandem with B1-10-1.

Recommendation B2-1-1:

We recommend that the 4050 section of the Forest Service Manual be revised, to consider the entire process of research planning as it applies to the development of applications, including software. Planning for technology transfer needs to be interwoven into existing research planning procedures, particularly in problem selection and the development of problem analyses. During this process, projects for which a separate TT plan will be needed should be identified. Technology transfer plans provide a mechanism for identification of users, evaluation of the need for software development, and assignment of responsibility for distribution and maintenance of software, including the definition and identification of official versions.

PNW - Accept, particularly as this pertains to software development. (Allocated)

PSW - Accept.

INT - Reject--FSM 4050 revision is in progress.

RM - Accept.

NC - Reject--We strongly disagree with the basic premise of the recommendation (i.e., that technology transfer needs to be interwoven into the research planning process). Research planning requires an appropriate assessment of user needs, potential benefits of the research, and a general consideration of the applicability of the expected results. This is not technology transfer. Technology transfer planning and

implementation should occur following or near the completion of the research. Only then is it possible to realistically identify the information to be transferred, the audiences, the transfer media, etc. Too much emphasis on technology transfer at the beginning of the research is counterproductive because it incorrectly assumes that research outputs can be predicted and it results in technology transfer plans that will not be implemented. Software, while currently new and unique, is simply one of many technology transfer media. FSM 4050 has just been revised and it should be finalized without further delay. Furthermore, guidance regarding technology transfer is more appropriately placed in FSM 1320.

FPL - Accept.

SO - Accept.

NE - Duplicates B1-4-2 in part.

SE - Accept with comment - Much of the language in this recommendation belongs in the issue statement. This recommendation has already been implemented at Southeastern Station. Needs target date.

Recommendation B2-1-2:

The Deputy Chief for Research should now establish a committee to further define desirable software characteristics. The committee should address:

- 1) Internal program structure.
- 2) Internal documentation including comments and variable definition.
- 3) External documentation needed.
- 4) Disclaimers.
- 5) Definition of "official" as it relates to software.

Three distinct types of documentation should be considered for each software package: a) Software description - Provide formulae, algorithms, and organization of program, data requirements and formats for input and output. There should be sufficient information (e.g. example I/O data) to allow reviewers to judge the computational accuracy and efficiency of the software.

b) Validation - Provide information to assess the ability of the package to meet its intended purpose. E.g., does a particular growth and yield simulator accurately reflect the actual growth and yield of forest stands that it is meant to forecast.

c) User manuals - Provide necessary information to access software, describe input requirements, and input options including mechanisms for accessing. Describe the range of uses for this software, including limitations and ways to interpret output.

Composition of the committee should include scientists involved in programming from each Research Station.

PNW - Accept.

PSW - Accept with reservations. We tend to think that the tasks for the committee can be done better by professional system staff. We suggest adding, (d) Programmers Maintenance Manual.

INT - Accept with comment--Combine with #B1-4-2.

RM - Accept.

NC - Accept with comment--Needs coordination with No. A1-7-1. Before

this is done, we need to define who would be required to use the guidelines and what sort of review the software itself would undergo.

FPL - Accept.

SO - Accept.

NE - Accept w/comment - partially overlaps B1-4-2.

SE - Duplicative - Combine with B2-1-3 and set due dates.

Recommendation B2-1-3:

Make training available to transmit standards developed in the above recommendation to Station personnel.

PNW - Accept with comment. This should be transmitted from top management down.

PSW - Accept with comment. This could be combined with recommendations A1-7-2 and B1-1-2.

INT - Accept.

RM - Accept.

NC - Accept with comment--Need to identify to whom standards would be submitted and who would use them.

FPL - Accept.

SO - Accept.

NE - Reject in part - recommendation doesn't follow from needs statement. It's not clear what training is needed or why.

SE - See B2-1-2.

Recommendation B2-1-4:

Policy should be developed to require publication of major Research developed software where it is appropriate. This does not necessarily mean printing the detailed code. The software and related documentation should follow the same procedure of review required for traditional publications.

PNW - Accept with comment. This is already policy.

PSW - Accept.

INT - Accept.

RM - Accept.

NC - Accept with reservation--The policy to be developed will need to define "appropriate".

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Duplicative - Combine with B2-1-5 and B2-1-6 and set due dates and identify responsible officials.

Recommendation B2-1-5:

Station scientific and administrative personnel be assigned to the

committee developing this proposal.

PNW - Rewrite. Does this refer to all recommendations under B2-1, or, does it refer only to item B2-1-4 on publication of new software?

PSW - Accept with comment. Could be combined with recommendation A1-7-2. See comment for A1-7-2.

INT - Rewrite--Does not make any sense as written.

RM - Accept.

NC - Accept with comment--Need to coordinate with No. A1-7-2. The reference to "this proposal" should read instead: "the proposal to establish a national repository for Forest Service developed software".

FPL - Accept.

SO - Accept.

NE - Accept.

SE - See B2-1-4.

Recommendation B2-1-6:

Forest Service policy should require entry of all software that is published, or documented, into this National Software Repository. We further recommend that a periodic directory of that software be published and circulated both inside and outside the Forest Service.

PNW - Accept.

PSW - Accept with reservations. This will take some big bucks.

INT - Accept with comment--Make specific to scientific software so not confused with #A1-7-3.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - See B2-1-4.

Recommendation B2-2-1:

The Chief should appoint a standing committee to explore the feasibility of electronic journals for forestry research. This committee should include Station scientists and editors and WO - InS staff representatives.

PNW - Accept.

PSW - Accept.

INT - Accept.

RM - Accept.

NC - Accept.

FPL - Accept.

SO - Accept.

NE - Accept.

SE - Accept with comment - Southeastern Station volunteers Bob Biesterfeldt to assist in this study. Also, this recommendation needs a

due date.

Recommendation B2-3-1:

A bibliographic data base containing all information required for library cataloguing should be maintained in each Station. Data bases should all conform to a standard format. Each record should contain sufficient information (e.g., RWU No.) for report generation. Each Station should have personnel trained to enter data in the standard format. These data bases should be accessible to all FLIPS users.

PNW - Accept with the thought that such a bibliographic data base should be restricted to information gathered in the Station or in Station-cooperator arrangements. To go beyond that would appear duplicative and unnecessary because of the availability of WESTFORNET and other broader sources of bibliographic data.

PSW - Accept with rewrite. The wording in the first sentence needs to be improved but the spirit is understood. One of the InS library study groups is devoted exclusively to this problem. Could be combined with recommendation A2-7-4

INT - Accept with comment--Combine with #A2-7-4.

RM - Accept.

NC - Accept with reservation--As written, these local data bases should not be available to all FLIPS users. Those outside of a Station should have to access these data bases through their librarian, as outlined in No. B1-1-1. In reality, a separate data base for each Station may not be as valuable as a centralized one that would contain each Station's data and be more accessible to all FLIPS users. This would be taking full advantage of the distributed processing potential.

FPL - Accept.

SO - Accept with comment - The contents of the bibliographic data base needs to be established in order to avoid being duplicative of other bibliographic data bases such as NAL.

NE - Accept.

SE - Accept with comment - Needs due date and responsible officials.

Recommendation B2-3-2:

Software should be developed to generate output of the bibliographic data base in any desired format, eg., ANSI, CBE, other journal formats, internal report formats. We suggest that a Station be designated to acquire and test such software for Service-wide application.

PNW - Accept.

PSW - Accept with comment. Some reviewers understood that WESTFORNET was developing FAMULUS to meet the objectives outlined in this recommendation. WESTFORNET says this isn't true. That, "If the FS wants this, they'll have to fund a programmer to write the stuff and then test it. This job is not covered in our current program or plans."

INT - Accept.

RM - Accept.
NC - Accept.
FPL - Accept.
SO - Accept with comment - The journal formats will have to be limited because there are so many different journal formats. The software will probably have to be written.
NE - Accept.
SE - Accept with comment - Needs due date and responsible officials.

Recommendation B2-3-3:

Research Station scientists and administrators, in addition to library specialists, should be represented on the InS committee which is studying a FORNET data base to be made accessible through FLIPS as a national system. The committee should consider alternatives in providing bibliographic services, such as that now used by NE at NAL.

PNW - Accept.
PSW -
INT -
RM - Accept.
NC - Accept with comment--This effort is now well underway, but so far has included only library personnel from the various Stations. A second meeting is tentatively scheduled in August at the FPL in Madison. An effort should be made to include one or more scientists and management personnel from the Stations in the session. Since library service also will be provided to NFS personnel, we should also include representative(s) from NFS at that time, as well.
FPL -
SO - Accept with reservations - There is a great amount of work to be done. We do not understand the capabilities of FLIPS nor are we sure what the NAL can do for us. We do not understand what the user needs. The last sentence is misleading as the only thing NE is doing is stationing a person at NAL to provide services.
NE - Accept.
SE - Accept.

Recommendation B2-4-1:

The Work Group supports the development of a Region/Station(s) prototype system and feels that further recommendations on this issue are not required at this time.

PNW - Accept.
PSW - Accept with reservations. We reserve the right to complain depending on which Region(s) and Station(s) are selected.
INT - Accept with comment--Add that this relates to user identified research need.
RM - Accept.
NC - Accept with comment--We know that Regions, other than R-8 are also

developing "prototypes". One of those is R-9. If an assignment is made to R-8/SO/SE, they should coordinate closely with other Regions.

FPL - Accept with comment. Should include a librarian. Librarians are on the cutting edge of this type of technology, and frequently may be better informed than the editors and scientists. Last sentence should read, "This Committee should include Station and FPL scientists, editors, and librarians, and WO-InS Staff representatives."

SO - Accept.

NE - Accept.

SE - Accept - No action.

APPENDIX B: Participant Roster by Assignment

Roger R. BAY, PSW - Workshop Host/Facilitator
William T. SOMMERS, R, FFASR - Workshop Chairman
Carolyn B. EVERETT, R - Workshop Coordinator

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Eldon W. ROSS, SE, Chairman

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Robert B. ERICKSON, NE, Chairman..1
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Deborah C. ALLEN, RM.....3
Denver P. BURNS, NE.....4
John R. ERICKSON, FPL.....5
Beverly C. HOLMES, INT.....6
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John F. PROKOP, NC.....10
Neil B. SMITH, PSW.....11
Susan A. TRIPLETT, R6.....12

A2. Budget Process and Related Reporting Areas Work Group

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B. Research Issues Area

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B1. Research Work Unit Work Group

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B2. Research Output and Technology Transfer Work Group

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